AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INCORPORATED

ABN: 53 412 417 012

TECHNICAL PROCEDURES MANUAL (TPM)

Commencement date: **2 December 2023**

[CASA CASR Part 103 MOS ss. 3.10(1)(c)(i)]

Incorporating as PARTS 2, 3 and 4

ASRA ACCEPTANCE & LISTING PROCESSES

(CASA CASR Part 103 Manual of Standards (MOS), Chapter 3)

ASRA DEFAULT SYSTEM OF MAINTENANCE

(CASA CASR Part 103 Manual of Standards (MOS), Chapter 7)

ASRA MAINTENANCE APPROVALS

(CASA CASR Part 103 Manual of Standards (MOS), Chapter 7)

This document is to be used in conjunction with:
ASRA Basic Gyroplane Construction Standards
ASRA Compliant Gyroplane Construction Standards

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Ensure this manual is complete by comparing sheets with the checklist. Notify any deficiencies immediately to the ASRA Head of Airworthiness and Maintenance (HAM) at technical@asra.org.au

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IMPORTANT NOTICE

A number of sample documents are embedded into this Manual for information purposes only. They are:

Section 15 - Sample database ANNUAL INSPECTION input screen
Section 16 - Sample ASRA Form F024
Section 17 - Sample ASRA Form F006
Section 19 - Sample ASRA Form F022
Section 20 - Sample ASRA Form F006
Section 31 - Sample ASRA Form F007
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Section 39 - Sample ASRA Form F019

Annexe 1 - Sample ASRA Standard Flight Manual

ALL THESE SAMPLE FORMS ARE INCLUDED FOR INFORMATION PURPOSES ONLY – ALWAYS DOWNLOAD THE CURRENT "LIVE" FORMS FROM OR ON THE ASRA WEBSITE.

ABBREVIATIONS

AC	Advisory Circular (CASA or FAA)
AD	Airworthiness Directive Issued by CASA or an overseas National Airworthiness Authority
AFM	Aircraft Flight Manual
AN	Airworthiness Notice
AP	Authorised Person – holds a CASA Instrument of Appointment to perform certain specified airworthiness functions
ASTM	ASTM International (formally the American Society for Testing and Materials), referred to in AC 21.42 who issue standards such as the Standard Practice for Continued Operational Safety Monitoring of a Light Sport Aircraft.
BCAR-T	British Civil Airworthiness Requirements – Light Gyroplanes
CAAP	Civil Aviation Advisory Publication
CAO	Civil Aviation Order (Australia)
CAR	Civil Aviation Regulations 1988 (Australia)
CASA	Civil Aviation Safety Authority (Australia)
CASR	Civil Aviation Safety Regulations 1998 (Australia)
CoA	Certificate of Airworthiness (CASA)
SCoA	Special Certificate of Airworthiness (CASA)
CG	Centre of Gravity
CoL	Certificate of Listing
CoTA	Certificate of Type Acceptance (issued by ASRA)
ENG	Engine
EASA	European Aviation Safety Agency (Europe)
FAA	Federal Aviation Administration (USA)
FOT	First of Type
HAM	Head of Airworthiness and Maintenance
ICAO	International Civil Aviation Organization
LAME	Licensed Aircraft Maintenance Engineer (Part 66) LM
LSA	Light Sport Aircraft
E-LSA	Experimental Light Sport Aircraft
MA	Maintenance Authorization/Authority MARAP
MARAP	Modification And Repair Approval Process
MOS	Manual of Standards (CASA)
MTOW	Maximum Take-off Weight
NAA	National Airworthiness Authority. This is the authorized regulatory body responsible for the administration of aircraft standards and certification of an ICAO Contracting State
OEM	Original Equipment Manufacturer
PFI	Pre Flight Inspection
POH	Pilot’s Operating Handbook

PM	Pilot Maintenance
RAAus	Recreational Aviation Australia Ltd.
SA	Safety Alert (ASRA)
SAB	Sport Aviation Body [nomenclature used for ‘SAB Flight Permits’ CAO 95.12.1(5A)]
SAFA	Sports Aviation Federation of Australia
SB	Service/Safety Bulletin – Airworthiness document issued by an aircraft or component manufacturer
SI	Service/Safety Instruction – Airworthiness document issued by an aircraft or component manufacturer
SFP	Special Flight Permit
STA	Senior Technical Adviser (ASRA)
TA	Technical Adviser (ASRA)
TAC	Type Acceptance Certificate issued by CASA
TC	Type Certificate issued by CASA or a NAA of an ICAO member state
TNs	Technical Notes (ASRA)
TPM	Technical Procedures Manual (ASRA)
TTIS	Total Time in Service
UK	CAA Civil Aviation Authority UK
UL	Ultralight Aircraft (not LSA or E-LSA)
W&B	Weight and Balance

DEFINITIONS

Airworthiness

The word “airworthiness” has no one-sentence or one-paragraph definition either internationally or within Australian civil aviation law. However, overarching international guidance on the principles of airworthiness is contained within the International Civil Aviation Organisation (ICAO) Annex 8 to the [Chicago] Convention on International Civil Aviation, to which Australia is a signatory state. Annex 8 is titled ‘Airworthiness of Aircraft’, a comprehensive document of 216+ pages. While many CASA regulations include extremely detailed airworthiness requirements, CASA uses the general ‘airworthiness’ definition contained in Australia’s Macquarie dictionary for an overarching statement of principle:

> *Adjective* (of an aircraft) meeting accepted standards for safe flight; equipped and maintained in condition to fly.

Amateur-built aircraft (CASA definition)

Is a CASA definition that applies to aircraft described in CASR Part 21.191(g) which reads: ‘*operating an amateur-built aircraft that is an aircraft the major portion of which has been fabricated or assembled by a person who undertook the construction project solely for the person’s own education or recreation.’* This is reflective of the U.S. FAA 51% rule for amateur construction.

A sizeable proportion of the ASRA gyroplane ‘fleet’ comprise second-hand home-builds or hybrid rebuilt gyroplanes. ASRA policy is that subsequent owners or operators of homebuilt or hybrid-rebuilt gyroplanes assume 100% responsibility for the airworthiness of the gyroplane and must maintain the gyroplane in accordance with the approved Flight Manual for that aircraft. In circumstances where the owner or operator lacks sufficient skill and technical experience to competently maintain their aircraft, they MUST enlist qualified and experienced assistance to undertake inspection and maintenance programs – see Parts 3 and 4 of this Manual for guidance.

Amateur-constructed gyroplane (ASRA definition)

Is an ASRA-specific term that is intended to have broad application to cover any home-built or built-to-order gyroplane, whether built by the current owner or bought second-hand. Specifically, ASRA places its maintenance emphasis on the rights of the current owner, whether the gyroplane is constructed by that owner or has been bought second-hand. ASRA requires owners and operators of gyroplanes to become fully conversant with the inspection and maintenance requirements for their particular gyroplane - see Parts 3 and 4 of this Manual for guidance.

ASAO

An Approved Self-administering Aviation Organisation (under CASR Part 149)

ASAO Certificate

A certificate issued by CASA under regulation 149.075.

ASAO Enforcement Power

Means the power to vary, suspend or cancel an authorisation issued by an ASAO other than at the request of the authorisation holder.

Bearing factor

Relevant to Compliant Standard D60, the 'bearing factor' concerns parts that have clearance (free fit) with other components or surfaces that are subject to pounding or vibration. The Standard requires that the surfaces that come into contact are of appropriate material and of sufficient in-contact surface area to ensure that each component is not distorted or progressively damaged by pounding or vibration. In gyroplanes, this is most relevant to control rod and rudder deflection stops, and to the rotor hub tilting and teeter stops.

CAA (Cth)

The Civil Aviation Act 1988 (Australia).

Cable Factor

Relevant to Basic and Compliant Standards D70, in gyroplanes the Cable Factor is mostly concerned with rudder cables but also applies to control pushrod systems as well. The Cable factor requirements ASRA uses are adapted from the U.S. FAR 27.685, titled:

'Control system details'.

(a) Each detail of each control system must be designed to prevent jamming, chafing, and interference from cargo, passengers, loose objects or the freezing of moisture.

(b) There must be means in the cockpit to prevent the entry of foreign objects into places where they would jam the system.

(c) There must be means to prevent the slapping of cables or tubes against other parts.

(d) Cable systems must be designed as follows:

  (i) Cables, cable fittings, turnbuckles, splices, and pulleys must be of an acceptable kind.
  (ii) The design of the cable systems must prevent any hazardous change in cable tension throughout the range of travel under any operating conditions and temperature variations.
  (iii) No cable smaller than specified in each of the ASRA Gyroplane Construction Standards may be used in any primary control system.
  (iv) Pulley kinds and sizes must correspond to the cables with which they are used.
  (v) Pulleys must have close-fitting guards to prevent the cables from being displaced or fouled.
  (vi) Pulleys must lie close enough to the plane passing through the cable to prevent the cable from rubbing against the pulley flange.
  (vii) No fairlead may cause a change in cable direction of more than 3°.
  (viii) No clevis pin subject to any longitudinal or pull-out load or motion and retained only by washers and cotter pins may be used in the control system.
  (ix) Turnbuckles attached to parts having angular motion must be installed to prevent binding throughout the range of travel.
  (x) There must be means for visual inspection at each fairlead, pulley, terminal, and turnbuckle, or in other words these components cannot be concealed from view.

(e) Control system joints subject to angular motion must incorporate the following special factors with respect to the ultimate bearing strength of the softest material used as a bearing:

  (i) 3.33 for push-pull systems other than ball and roller bearing systems.
  (ii) 2.0 for cable systems.

(f) For control system joints, the manufacturer's static, non-Brinell rating of ball and roller bearings must not be exceeded.

CAR

The Civil Aviation Regulations 1988 (Australia).

CASRs

The Civil Aviation Safety Regulations 1998 (Australia).

Casting Factors

Relevant to Compliant Construction Standard D55, casting is a manufacturing method where an object is formed by pouring molten metal into a mould, allowing the material to solidify within the mould. In gyroplanes, castings are sometimes found in undercarriage components such as wheel hubs and axle mounts.

The concern with castings is that history shows that casting quality can be inconsistent. Castings are also commonly used in engine components such as valve covers, alternator cases, starter motor casings and propeller speed reduction gearbox cases.

Casting must not to be confused with Forging, where a semi-molten metal billet is smashed into a mould under huge forces, producing a component of enormous strength compared to simple casting. Forgings are commonly used in helicopter hub components such as blade grips.

Castings are commonly produced in massive quantities, which generally establishes '*a history of safe operation*'. However, the concern is that castings produced in much lower quantities or from third-world economies used as wheel hubs or axle mounts can be problematic and may possibly fail.

ASRA has settled on a Casting Factor of 1.5, meaning that the cast component must demonstrate the ability to withstand a 150% overload (i.e. if normal load = 1, casting factor needs to be 2.5 being 1 + 1.5). If castings are used in undercarriage components, this factor will normally be satisfied by successful completion of the drop test requirement.

NOTE: ASRA **forbids** the use of castings in gyroplane hub and head components.

Certificate of Acceptance

A certificate issued by ASRA in relation to a Part 103 gyroplane

Certificate of Airworthiness (CASA definition)

Means a standard certificate of airworthiness or a special certificate of airworthiness, either issued by CASA or by an authorised CASA delegate.

Certificate of Acceptance and Listing (ASRA definition)

An entry into the official ASRA database made either by the Operations Manager or the Registrar that a gyroplane has been assessed as conforming with ASRA Gyroplane Construction Standards or the UK BCAR Section T, such entry can be evidenced either by an annual-listing-sticker or additionally by a paper certificate if the owner so requests.

The issuing of an ASRA Annual Listing Placard for adhesion onto the gyroplane mast for operational purposes is also prima facie an ***'SAB Flight Permit'*** as prescribed in CAO 95.12.1 Instrument 2021 section 5A.

Damage

A compromise of the structure of an aircraft that has been brought about external factors affecting or impacting the structure, or the aircraft hitting external objects or surfaces, or compromise brought about by an aircraft component failure, and for which repair is required to regain original structural integrity. Damage can be either minor or major. Minor damage is often called "superficial damage" or "hangar rash".

Engine

A mechanical device designed and constructed to operate using internal combustion to impart rotary motion to a crankshaft / output shaft.

Fitting Factor

Relevant to Compliant Construction Standard D65, for each component and fitting whose strength is not proven by limit or ultimate load tests in which actual stress conditions are simulated in the fitting and surrounding structure, a fitting factor of at least 1.15 must be applied to each part of –

(a) the fitting;
(b) the means of attachment; and
(c) the bearing on the joined members.

In gyroplanes, the fitting factor is most relevant to the fittings to which seats, safety belts or harnesses attach to the airframe. U.S. FAR 29.625 requires that **the fittings themselves** must independently be able to withstand that calculated inertia forces elsewhere specified for forward, rearward, downward or sideward impact forces seats and harness are to withstand, multiplied by a fitting factor of **33%** above the calculated inertia forces the fitting will be subjected to during the relevant impact.

General Aviation

General aviation (GA) is defined by the International Civil Aviation Organization (ICAO) as all civil aviation aircraft operations with the exception of commercial air transport or aerial work, which is defined as specialized aviation services for other purposes. However, for statistical purposes, ICAO uses a definition of general aviation which includes aerial work.

General aviation thus represents the "private transport" and "recreational" components of aviation.

Hub Bar

A gyroplane rotor component comprising a cantilever aluminium bar usually of flat rectangular cross-section, usually of 6061-T6 or 2021-T3 alloy, to which the rotor blades are attached to each end of the hub bar and on which a central hub block is mounted through which a teeter bolt runs from side to side and on which the rotor assembly "teeters" within the hub. The hub-bar therefore tilts usually between two "towers" or "bearing blocks" on either side of the hub-bar, these in turn being bolted to the hub bearing block. Alloy hub-bars have been known to fail catastrophically in flight and are therefore usually a life-limited component, with each manufacturer specifying the applicable service life.

Hub – Side-plate variety

In Tervamaki, Magni, Titanium Explorer and Nano gyroplanes the rotor assembly does not have a hub bar. Instead, the rotor blades are attached to steel or titanium side-plates shaped like a flattened triangle with cut-off tips. A teeter bolt runs laterally between each side-plate into bearings placed near the central apex. A vertical spindle axle is positioned between the two side-plates, through which the teeter bolt runs to allow for the rotor assembly to "teeter" in relation to the hub. Impressively, there is no recorded failure of a side-plate rotor assembly.

Light Aircraft

Historically, Light aircraft are aircraft that have a maximum gross take-off weight (MTOW) of 12,500 pounds (**5,670 kilograms**) or less. While a light aircraft may be used for general aviation, it can also perform roles under commercial air transport, and more specialized aerial work. In recent decades the ICAO has rounded the weight limit up to **5700 kg**.

Light Sport Aircraft

Internationally, Light Sport Aircraft are usually aircraft that have a maximum gross take-off weight (MTOW) of **600 kilograms or less** and are usually limited to being either single-place or two-place. A slightly increased allowance (usually to 650 kg MTOW) applies to float-equipped aircraft.
The CASR Dictionary now includes an all-encompassing definition of light sport aircraft, the following provisions being applicable to gyroplanes:

Light Sport Aircraft means an aircraft that:

(a) has:

(i) if the aircraft is not intended for operation on water – a maximum take-off weight of 600 kilograms or less; or

(ii) if the aircraft is intended for operation on water – a maximum take-off weight of 650 kilograms or less;

(c) if the aircraft is a powered aircraft that is not a glider – has a single, non-turbine engine fitted with a propeller; …….

[non-relevant sub-sections omitted]

(d) if the aircraft is designed to be equipped with seating – has a maximum seating capacity of 2 persons including the pilot.

Maintenance (Civil Aviation Act 1988 – s. 3)

"Maintenance" means any task required to ensure, or that could affect, the continuing airworthiness of an aircraft or aeronautical product, including any one or combination of overhaul, repair, inspection, replacement of an aeronautical product, modification or defect rectification.

Maintenance Authentication

Maintenance Authentication is the action of signing the aircraft logbook by a suitably qualified person underneath the listing of all maintenance carried out at that time and formally indicating that the maintenance conducted at that time is to the standard specified in the ASRA Technical Procedures Manual. All maintenance must be authenticated by an appropriate person as specified in this ASRA Technical Procedures Manual. Persons authenticating maintenance are to sign the aircraft logbook, print their name and initials, their ASRA membership number, and the date they signed the document.

Motor

A mechanical device designed and constructed to operate using electricity, or hydraulic fluid, or compressed air, to impart rotary motion to an output shaft.

Part 103 (CASA)

Civil Aviation Safety Regulation 1998 Part 103, which regulates all aircraft that are not on the national (VH) aircraft register in Australia as from 2 December 2021.

Part 103 (FAA)

United States Federal Aviation Administration (FAA) Federal Aviation Regulations Part 103 issued 4 October 1982 allowing for single-place ultralight aerial vehicles operating at 55 knots maximum airspeed, with 5 U.S. gallons fuel, and weighing not more than 254 pounds.

Recognized Foreign Countries & other agencies

Under CASR 21.010B, CASA issues Type Acceptance Certificates against foreign Type Certificates from the following countries: Canada, New Zealand, France, Federal Republic of Germany, Netherlands, United Kingdom, USA.

EASA (European Aviation Safety Agency) is also a recognized agency.

Recognized Standard Parts

Lists of commercially available parts which do not require separate substantiation where such substantiation is required. The designer of the part is responsible for specifying the purpose intended for the part.

Recognized Standard

Any Australian or international aircraft, aircraft equipment, aircraft operational, and airworthiness standard acceptable to CASA.

RELEVANT AUSTRALIAN AVIATION LEGISLATION AND REGULATIONS

1. **Civil Aviation Act 1988 (Cth)**
The Civil Aviation Act 1988 (or "CAA") governs civilian aviation in Australia, from airline operations (or "RPT"), through to commercial aviation such as charter, commercial, private and recreational aviation.

2. **Civil Aviation Regulations 1988 (Cth)**
The Civil Aviation Regulations 1988 (or "CARs") set out in greater detail than is contained in the CAA how entities and people are to undertake their particular aviation activities.

3. **Civil Aviation Safety Regulations 1998 (Cth)**
Originally intended to be the vehicle for adopting large swathes of the U.S. Federal Aviation Regulations into Australia (as well as EASA requirements), the CASRs have evolved to align with ICAO taxonomy.

Relevant 'PARTS' of the CASRs applying to sport and recreational aviation are:

CASR Part 43 - CASR Part 43 is a new inclusion intended to apply to VH-registered amateur-built light and recreational aircraft. It prescribes an inspection-base system, with the primary anchor of safety being a periodic inspection to ensure the aircraft still complies with the original type certificate and any Airworthiness Directives (ADs) applicable to the type.

An important feature of Part 43 is that it provides a scheme for amateur-built light aircraft owners to undertake training to become accredited as an "AMT-2" ("Aircraft Maintenance Technician" level 2) certificate holder (if they are the primary builder of an aircraft, in which case their AMT-2 certificate will be issued with the aircraft's Certificate of Airworthiness) or an "AMT-3" certificate holder (if they are a second-hand owner).

For a second-hand owner to receive an AMT-3 certificate or approval, they need to do not less than 16 hours of instruction given by an "approved training provider" on how to do an "annual inspection" on the type of amateur-built aircraft they have.

See CASA **Consultation Draft Part 43 Maintenance of Aircraft in Private and Aerial Work Operations** – Plain English Guide, Version 1.

At time of writing (November 2022) both ASRA and RAAus are considering adopting similar inspection and maintenance accreditation along the AMT-2 or AMT-3 lines for Part 103 aircraft.

CASR Part 61 – CASR Part 61 sets out the requirements and standards for the issue of CASA flight crew licences, ratings and other authorisations. This is becoming increasingly relevant to sport and recreational aviation because many sport and recreational pilot certificate holders also have CASA conventional pilot licences for light (VH) aircraft. **Importantly, Part 61 requirements do not apply for aircraft operated under CASR Part 103, where ASAO pilot certificates issued by separate ASAOs are the relevant authorisations.**

A further relatively recent pilot licensing development has been the implementation of a Recreational Pilot Licence with lower medical standards but with more restricted operational limitations.

CASR Part 103 – CASR Part 103 and its associated Part 103 Manual of Standards cover Australian Sport and Recreational aircraft usually not on the national VH register (gliders are the exception because they are regulated under Part 103 but also carry VH registration).

Part 103 aircraft (other than gliders) are NOT allocated a VH registration, and instead are **"Listed"** by the relevant ASAO assigned to their administration and management.

CASR Part 105 - CASR Part 105 covers parachuting operations.

CASR Part 138 – CASR Part 138 - Aerial Work Operations and its Manual of Standards (MOS) are designed to manage the safety risks of current and future aerial work operations. The rules will

apply to people and operators who conduct aerial work activities in airplanes and rotorcraft. Aerial work is when an aircraft is used for specialized services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, and aerial advertisement. Part 138 is used as a reference by CASA when considering aerial mustering in Part 103 aircraft, such as gyroplane aerial mustering.

CASR Part 149 – CASR Part 149 and its associated Part 149 Manual of Standards (MOS) is the regulatory instrument that: sets out the framework by which organisations administer their activities and details requirements organisations must meet for ongoing approval as an ASAO.

The primary advantage of Part 149 is that, for the first time, independent recreational aviation associations have been given formal regulatory recognition to manage and administer the activities of their member-pilots.

ASRA-RECOGNISED INTERNATIONAL STANDARDS AND REFERENCES

Standards

1. International Civil Aviation Organisation (ICAO) Annex 8 to the Convention on Civil Aviation 'Airworthiness of Aircraft'
2. United States Federal Aviation Regulation (FAR) 14 CFR – Part 27 – AIRWORTHINESS STANDARDS – GENERAL CATEGORY ROTORCRAFT
3. **U.K Civil Aviation Authority (CAA) CAP 643 – British Civil Airworthiness Requirements Section T – Light Gyroplanes * (usually known as *BCAR-T*)**
4. EASA (European) CS - 27 Certification Specifications for Small Rotorcraft
5. EASA (European) CS – VLR Easy Access Rules for Very Light Rotorcraft (Amendment 2)
6. U.S.A. ASTM F2352-14 Standard Specification for Design and Performance of Light Sport Gyroplane Aircraft

*** NOTE:** CASR Part 21 and the associated Part 21 Manual of Standards recognises as **LSA Standards** [in CASR paragraph 21.172(b)] both the **UK CAP 643 – BCAR–T** (see above) as well as the ASRA Gyroplane Construction Standards.

References

1. U.S. Department of Transportation – Federal Aviation Administration AC 43.13-1B 'Acceptable methods, techniques, and practices' 'AIRCRAFT INSPECTION, REPAIR & ALTERATIONS
2. U.S. Department of Transportation - Federal Aviation Administration AC 90-89B 'Amateur-Built Aircraft and Ultralight Flight Testing Handbook. 27 April 2015.

PART 1

GENERAL INFORMATION

Section 1

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INC.

1.01. In 1983 the Australian Sport Rotorcraft Association (ASRA) was created as an Incorporated Association in the Australian Capital Territory (ACT).

1.02. ASRA is a national association with members in every State and in some territories.

1.03. ASRA came into existence after the-then Department of Transport, Air Transport Group in the early 1980s insisted that state or regional gyroplane clubs amalgamate into a national organisation, to both better represent the interests of gyroplane enthusiasts and to act as a single point of contact for the regulator to deal with.

1.04 Since the inception of the first ANO (later CAO) 95.12 Exemption in 1977, the way the Exemptions originally worked was that they were directed toward the individual operators of gyroplanes.

1.05. After ASRA's inception, however, the Exemptions directly recognised ASRA by requiring that gyroplanes had to be constructed to a '…. *standard acceptable to the ASRA*.'

1.06. ASRA is a volunteer organization constituted to promote and advance sport rotorcraft activities in Australia. It is set up on a not-for-profit basis.

1.07. ASRA is sometimes called a ***'sport aviation body'*** by CASA.

ASRA's Part 149 Certificate - 2023

1.08. ASRA's CASA-issued Part 149 Certificate allows ASRA to:

a. administer the flight operations of ultralight and LSA gyroplanes; and

b. administer the airworthiness activities of ultralight and Light Sport Gyroplanes.

1.09. One important aspect of being as ASAO under Part 149 is that for the first time ASRA is now properly recognised within the Regulations as an entity with clearly assigned obligations and responsibilities. This clarity simply did not exist under the Civil Aviation Orders.

1.10. Another important aspect of the transition to becoming an ASAO recognised by the Regulations is that the concept of Exemption will be displaced once and for all. It has long been legally recognised that the use of Exemptions - while useful for allowing activities to occur that would otherwise not be lawful – creates problems when misbehavior or misconduct needs to be held to account.

1.11. Part 149, therefore, creates positive rights and responsibilities for ASAOs and individual ASAO members, and also includes clear penalties for wrongdoing.

Section 2

GYROPLANE HISTORY IN AUSTRALIA TO THE PRESENT DAY

2.01. Gyroplanes, in earlier times known as “Autogiros”, have been in Australia since the mid-1930s when a small number of Avro Cierva C 30s began appearing on the Australian national aircraft register (the “VH” register). These machines had 3-bladed rotors and were powered by a front-mounted 140hp 7-cylinder radial engine with a 2-bladed propeller. One example exists today in Sydney’s Powerhouse Museum.

2.02. Following World War II, helicopters displaced autogiros and the type fell into disuse.

2.03. In the early 1970s, a small number of McCulloch J2 2-seat gyroplanes were imported from the U.S. and also placed on the national VH register. These gyroplanes had side-by-side seating with a pusher engine installation and twin booms leading to a horizontal tail and twin vertical stabilizers and rudders. The J2s were uncompetitive compared to helicopters and small fixed-wing aircraft and also fell into disuse.

Recreational gyroplanes

2.04. Between 1957 and 1987, Dr Igor Bensen from Raleigh, North Carolina, produced the single-seat Bensen B8M “gyrocopter” as a kit available to amateur builders worldwide.

2.05. From the 1960s a small number of Bensen B8M kits arrived in Australia, being built and then mostly operated clandestinely, as Australian Aviation legislation at the time made no provision for lightweight homebuilt gyroplanes. Dr Bensen also sold plans sets.

Authorized sport gyroplane flying started for lightweight single-seaters from 1977

2.06. From 1977, the Department of Civil Aviation (DCA) began issuing ‘Exemptions’ from the Air Navigation Orders intended to facilitate lawful single-seat gyroplane flying over private property at between 300 and 500 feet provided the machine did not exceed 250 kg empty weight and had a maximum fuel capacity of 36 litres.

2.07. In due course, the upper height limitation was removed, as was the fuel quantity limitation and flying over public land also became lawful.

2.08. From 1989, an ‘Exemption’ providing for 2-seat gyroplanes commenced.

CAO 95.12 and 95.12.1 Legislative Instruments – operative through to 2023

2.09. At the time of writing, and most likely into 2023, light recreational gyroplanes in Australia are still governed by ‘Exemptions’, now generally known as ‘Legislative Instruments’.

2.10. The current Legislative Instruments are CAO 95.12 (for single-seaters) and CAO 95.12.1 (for 2-seaters).

CASR Part 103 – operative as from 2 December 2021

2.11. On 2 December 2021 Civil Aviation Safety Regulations (CASR) Part 103 came into effect. Part 103 is intended to govern and regulate all ultralight aircraft in Australia. Part 103 does not operate by exempting ultralight aircraft from existing law. Rather, it sets out a comprehensive positive-law system for operating ultralight aircraft within the Australian aviation law landscape.

2.12. Part 103 will not become fully operative until the Part 103 ‘Manual of Standards’ (MOS) is brought into effect, likely to be sometime in 2023 or 2024.

Current regulatory definitions of gyroplanes

2.13. The current regulatory definition of ‘gyroplane’ is found within the Dictionary to the Civil Aviation Safety Regulations 1998:

> ***Gyroplane*** means a power-driven, heavier than air aircraft supported in flight by the reaction of the air on 1 or more rotors which rotate freely on substantially vertical axes.

2.14. More detailed and up-to-date definitions are contained within Chapter 2, Division 1 of the CASR Part 103 Manual of Standards (MOS), which specify:

2.02 Basic ultralight gyroplanes

(1) A ***basic ultralight gyroplane*** is a rotorcraft that:

(a) is a single-place gyroplane (other than an LSA gyroplane); and

(b) has a single non-turbine engine and a single propeller;

(c) has an empty weight not exceeding 250 kg; and

(d) has a maximum take-off weight not exceeding 600 kg in any configuration.

2.03 Ultralight gyroplanes

(1) An ***ultralight gyroplane*** is a rotorcraft that:

(a) is a single-place gyroplane, or a two-place gyroplane, other than:

(i) an LSA gyroplane; or

(ii) a basic ultralight gyroplane; and

(b) has a single non-turbine engine and a single propeller; and

(c) has a maximum take-off weight not exceeding:

(i) if not equipped to operate on water – 600 kg; or

(ii) if equipped to operate on water – 650 kg; and

(d) has a rotor disc not exceeding 20 kg per square metre* at maximum take-off weight.

(*NOTE: this equates to 4.0963 pounds per square foot, which ASRA rounds out to 4 pounds per square foot).)

2.04 LSA Gyroplanes

(1) An ***LSA gyroplane*** is a rotorcraft that:

(a) is a single-place or a two-place gyroplane; and

(b) is a light sport aircraft in relation to which:

(i) a special certificate of airworthiness mentioned in regulation 21.186 of the CASR is in force; or

(ii) an experimental certificate is in force.

Section 3

ASRA LIGHT SPORT GYROPLANES

Light Sport Gyroplanes

3.01

[Pages 20 and 21 are **RESERVED** pending the release of the final CASR Part 103 Manual of Standards (MOS)].

[Pages 20 and 21 are **RESERVED** pending the release of the final CASR Part 103 Manual of Standards (MOS)].

Section 4

AMATEUR AND COMMERCIALLY CONSTRUCTED GYROPLANES IN AUSTRALIA

Amateur-construction

4.01. ASRA estimates that from the late 1960s approximately 800 gyroplanes have been amateur-constructed in Australia. Early on, small numbers of Bensen B8M complete kits, component kits, and rotors were imported from the U.S. by individuals, followed in the late 1980s by about twenty U.S. Air Command single-seat kits fitted with 2-stroke engines.

4.02. At any given moment, only about 200 of these previous amateur-builds are “current” on ASRAs records (i.e. – registered with ASRA or Listed). It is estimated that those other hundreds of machines not “on the books” can probably be accounted for in these ways:

a. some were destroyed in tip-over accidents or crashes;

b. most have been dismantled and parts discarded or lost or otherwise cannibalized” with some parts used in subsequent rebuilds; and

c. many are abandoned and forgotten about pushed into the dark corners of farm sheds and garages after the owners have lost interest or passed away.

4.03. From time to time, a few of these long-derelict “barn find” machines come to light advertised on websites such as Gumtree, usually by the relatives of the aging or deceased original owners (ASRA calls these gyros “Gumtree Specials” because they are bought by people who then contact ASRA wanting to recuperate and operate them).

4.04. Originally, most Australian amateur-constructed gyroplanes were initially Bensen copies or clones usually powered by comparatively low-powered Volkswagen engines with propellers bolted directly to the engine crankshaft (known as “direct drive”), meaning that performance was often marginal.

4.05. Inevitably, because gyro amateur constructors are inveterate copiers with some also being minor innovators, structural and configuration divergences emerged with the passing of time, some variants being highly successful, others unsuccessful.

4.06. The successful variants inevitably become the ones copied most prolifically, and this describes the grassroots process of evolution that has driven the ultralight aircraft movement. ASRA places great importance on whether or not earlier gyro designs or gyro components have a proven or demonstrated **history of safe operation**.

4.07. Usually, new-build gyros are simply actual physical copies of earlier machines, where the earlier successful machines are extensively measured, weighed and photographed.

4.08. Building from paper plans is now extremely rare because no reliable or trustworthy plans of contemporary designs are available.

4.09. ASRA estimates that 90% of amateur-constructed gyroplanes in Australia since 1990 are such “physical clones”, where they generally resemble each other but on closer inspection variations can be noticed.

4.10. In the late 1980s and 1990s, Austrian-built Rotax 2-stroke engines fitted with propeller-speed-reduction gearboxes gave many Australian amateur-constructed gyroplanes significant performance boosts, meaning that truly practical gyro flying was now easily achievable. Other amateur constructors opted for four-stroke Subaru EA81 or EJ22 engines, also using propeller-speed-reduction gearboxes.

4.11. Apart from variations on the Bensen design, some Australian amateur constructors opted to build tandem 2-seaters known as U.S. open-frame “Parsons trainers”, while others opted to clone the distinctive U.S. “Dominator” design, either as single or 2-seaters, the Dominator being noteworthy because the full-height all-moving vertical stabiliser (or “tall tail”) is fitted with cruciform horizontal stabilsers, the entire unit then being mounted closely behind the propeller.

Second-hand versus new builds

4.12. Approximately 90% of Australian gyroplanes, whether amateur-constructed or commercially-constructed have been acquired by their current owners as **second-hand** machines.

4.13. This fact is noteworthy because Australian civil aviation regulations in some respects make a distinction between the maintenance privileges of a person who has been the first-hand constructor of an aircraft, as against those who have merely bought a **second-hand** amateur-constructed aircraft.

Builds-to-order

4.14. ASRA recognises that a small number of skilled individuals in Australia provide or have provided gyroplane build-to-order services to ASRA member customers. For Registration or Listing purposes, these machines are not regarded as constructed by the purchaser.

4.15. By far the most prolific builder-to-order in Australia is Gyroscopic Rotorcraft of Broken Hill NSW, of which 100 complete machines have been allocated ASRA registration over almost two decades. The “Rosco” is also by far Australia’s most popular mustering gyro.

4.16. Gyroscopic rotorcraft is also a supplier of 6061-T6 frame and keel extrusions, rotor heads and hubs, spherical rod-ends and bushings, and undercarriage components.

Early commercially-constructed gyros

4.17. Apart from the Bensen B8M kits and clones mentioned in above Section 2, other U.S. manufactured single seat gyros entering Australia were the primarily kit-built Air Command from the late 1980s. ASRA also can say that since the late 1980s and several tens of 2-seat Canadian-built RAF 2000 Subaru-powered gyroplanes were imported into Australia, as well as a number of U.S. WindRyder streamlined single-seat gyros.

European Gyro Manufacturing

4.18. From the late 1990s / early 2000s ever-increasing numbers of European 2-seat commercially-built gyroplanes have been developed and increasingly imported into Australia.

4.19. The number of commercial gyroplane manufacturers has exploded in Europe over the last 2 decades, with manufacturers now operating in Austria, France, Germany, Italy, Poland, Slovakia, and Spain.

4.20. European commercial gyroplane producers include:

(a). Autogyro.de (Germany) (MTO Gyro)

(b). Aviation Artur Trendak (Poland)

(c). Aviomania (Cyprus)

(d). Carpentarie Pagotto (Italy) - Brako Gyro

(e). ELA Aviacion (Spain)

(f). Fusioncopter (Poland)

(g). Magni Gyro (Italy)

(h). Nikki Rotor Aviation (Bulgaria)

(i). Skycruiser Gyro (Hungary)

4.21. In addition to complete machines, a major supplier of rotors to some European manufacturers is:

(a). Averso Rotors – France

United States Gyro Manufacturing

4.22. Some gyro manufacturing is also occurring in the United States. The current manufacturers are:

(a). Air Command – Texas (reconstituted company)

(b). Silverlight Gyros – Florida

(c). Sport Copter - Oregon

Current ratio of amateur-constructed to commercially-constructed gyros in Australia

4.23. Slightly over 50% of the current paid-up registered or Listed gyroplanes on ASRAs books were commercially-constructed (factory-produced) gyroplanes (mostly of European origin).

4.24. Slightly over 12% of the current paid-up registered or Listed gyroplanes on ASRAs books are gyroplanes that were built-in-Australia-to-order by a small number of skilled builders.

4.25. The remaining 38% of registered or Listed gyroplanes are classified as amateur-constructed or home-builds.

Section 5

ASRA's GENERAL TECHNICAL POLICY

5.01. The following important factors have influenced the shaping of ASRAs General Technical Policy and Administration:

(a) Sport and ultralight aviation began as a grassroots movement in the 1970s and 1980s developing as a "bottom-up" process where enthusiasts and amateurs began homebuilding ultralight flying machines refining them by trial-and-error or iterative methods and where "top-down" sophisticated design followed by manufacturing simply did not occur;

(b) Modern gyroplanes in particular are the direct descendants of the grassroots homebuilding movement, where the evolved designs being operated today are not so much the outcome of sophisticated aeronautical design, but rather simply the result of successful earlier gyroplane designs being continually copied and refined;

(c) People who enter sport and recreational aviation usually do so either as people who have never flown before OR as "refugees" from the ever-increasing (sometimes crippling) costs of conventional general aviation (i.e. – Cessnas, etc.). In each case the new entrant is usually on a limited budget and is in search of a low-cost or modest-cost aviation experience;

(d) People entering sport and recreational aviation readily understand that in order to keep costs down, that ultralight aircraft are not designed and certified to the same technical standards of airliners or general aviation aircraft;

(e) Those undertaking sport and recreational aviation readily understand that all aviation involves varying levels of risk, and that sport and recreational aviation may involve higher levels of risk than would be acceptable in the more sophisticated forms of aviation (such as airlines). As such, the recreational or sport aviator accepts the potentially greater level of risk under the principle of "**informed participation**", where the participant voluntarily accepts and understands that a greater level of risk is inherent because of the low and slow operating environment of ultralights, combined with lower levels of technical sophistication to keep costs down to reasonable levels;

(f) ASRA is an incorporated association constituted to promote and advance gyroplane flying in Australia and its membership is made up of volunteers. Moreover, although ASRA has some professional pilots, engineers, and technicians within its ranks, the universal basis for membership is voluntary and recreational. Therefore, ASRA does not hold itself out to be any sort of Airworthiness Certification entity, but rather that it is simply an association of enthusiasts and volunteers entrusted with duties and responsibilities by CASA to manage and administer recreational and sport ultralight gyroplanes in Australia; and

(g) **Crucially**, ASRA **NEVER** directly certifies the airworthiness of any gyroplane in the way that - for instance - the U.S. Federal Aviation Administration "certifies" airliners for airline use. Instead, ASRA assesses the construction of a candidate gyroplane against the ASRA Gyroplane Construction Standards and if it meets those Standards, then ASRA will Accept and List that gyroplane on its books and will then not prevent an owner-pilot from flying the gyroplane entirely at his or her own risk.

Section 6

ASRA'S 2 SETS OF GYROPLANE CONSTRUCTION STANDARDS

6.01. Between the mid-1980s and 2010 ASRA, working in conjunction with CASA and its predecessors, progressively developed Australian gyroplane construction standards.

6.02. It was decided that two sets of gyroplane construction standards would be compiled:

(a) a Single-seater Construction Standard, which became known as the 'BASIC' gyroplane construction standard; and

(b) a 2-seater Construction Standard, which became known as the 'COMPLIANT' gyroplane construction standard.

6.03. The driving philosophy differentiating the two sets of construction standards was that while single-seaters were flown by owner-pilots who were voluntarily assuming the risks involved in the activity, the owner-pilot of a 2-seater owes a substantially enhanced duty of care towards the second occupant of their gyroplane.

6.04. Therefore, the 2-seater Compliant construction standards involved more exacting construction and compliance requirements than the simpler Basic (single-seater) construction standards.

6.05. Australia is the only jurisdiction to have gone down the two-sets-of-construction-standards pathway.

6.06. The Australian ASRA Gyroplane Construction Standards were and remain based on:

(a) U.K Civil Aviation Authority (CAA)
CAP 643 – British Civil Airworthiness Requirements
Section T – Light Gyroplanes

(b) U.S.A. ASTM F2352-14 – Standard Specification for Design and Performance of Light Sport Gyroplane Aircraft; and

(c) lessons learned from Australian gyroplane operations and accidents.

6.07. The ASRA Gyroplane Construction Standards continue to evolve gradually, being adjusted and refined to cope with technological advancements as well as ongoing operational experience.

Section 7

CHOOSING WHICH SET OF GYROPLANE CONSTRUCTION STANDARDS TO USE TO ASSESS A GYROPLANE

For single-seaters with an empty weight not exceeding 250 kg

7.01. To be used in the assessment of single-seat gyroplanes with an empty weight not exceeding 250 kilograms, sought to be classified and declared as a **Basic Ultralight Gyroplane** under CASR Part 103:

ASRA BASIC GYROPLANE CONSTRUCTION STANDARDS
Published date – 22 July 2022 or subsequent issues
36 pages.

NOTE: The designation of **Basic Ultralight Gyroplane** may have future implications for ASRA members who hold or may in future hold a CASA pilot licence (whether RPL, PPL or CPL) because it is conceivable that CASA may in future limit controlled airspace access privileges only to CASA licence holders flying gyroplanes classified as **Ultralight Gyroplanes** or **Light Sport Gyroplanes**.

For heavier single-seaters or for 2-place gyroplanes

7.02. To be used in the assessment of single-seat gyroplanes or two-seat gyroplanes sought to be classified and declared as **Ultralight Gyroplanes** or **Light Sport Gyroplanes** under CASR Part 103:

ASRA COMPLIANT GYROPLANE CONSTRUCTION STANDARDS
Published date – 22 July 2022 or subsequent issues
53 pages.

Section 8

ASRAs TECHNICAL POLICY RELATING TO AMATEUR CONSTRUCTION

8.01. After consideration of the inter-relating factors detailed above, ASRA has formulated the following policies relating to technical matters:

(a) At time of writing and for the foreseeable future ASRA is likely to remain the sole avenue for people in Australia aspiring to build or fly ultralight gyroplanes to realize those aspirations.

(b) Therefore, ASRA declares that it will not unreasonably withhold membership or participation to any person (subject to any directive from CASA concerning persons who have or are undergoing disciplinary or administrative processes from another ASAO or from CASA directly).

(c) ASRA respects the right of any person to attempt to construct a gyroplane as an amateur, regardless of the previous technical experience of that person or their mechanical aptitude.

(d) ASRA will render reasonable levels of assistance to any person who becomes a member and who aspires to become an amateur builder, but it must be clearly understood that the amateur builder remains solely legally responsible for the gyroplane under construction throughout. At no time does ASRA, or an ASRA Technical Adviser, or any other ASRA member assume any legal responsibility in relation to the gyroplane under construction.

(e) ASRA's gyroplane construction standards are publicly accessible documents and aspiring gyro builders, whether current ASRA members or aspiring to be an ASRA member, are expected and required to become fully aware of the gyroplane construction standards and how they apply to the gyroplane being constructed.

(f) Because of the mechanical simplicity of gyroplane frames and because gyroplane mechanical components are almost always fully accessible and easily inspected, ASRA does NOT conduct stage inspections during the construction of a homebuilt gyroplane.

(g) ASRA expects that amateur constructors will be able to evidence where they obtained parts and materials for their construction effort and MUST build frames and critical parts from proper aircraft /aerospace-grade materials and components, and must also keep comprehensive construction records such as clear and detailed digital photographs of each aspect of construction.

(h) ASRA reserves the right to insist that a builder provides to ASRA samples of airframe and component materials and components so that ASRA can independently verify any claims made by the builder by using independent metallurgical testing, including spectrographic, gas chromatographic, and tensile testing. The costs of any such testing is to be borne by the gyroplane builder.

(i) Where an ASRA Technical Adviser is confronted with a gyroplane component or assembly that is of fully "closed out" construction, incapable of being internally inspected and where the builder or constructor has no records or digital photographs of the component's internal construction, then the Technical Adviser is fully authorised to refuse to countersign that assembly or component.

(j) History shows that a small minority of well-intentioned people are simply incapable of proper workmanship and their attitude is simply incompatible with responsible and safe amateur building. Usually, these are the type of person who simply "can't be told" and who are supremely confident that whatever they create will be successful. Inevitably, their builds are failures.

(k) However, history also shows that many other people still exhibit the pioneering grassroots spirit of responsible experimentation and iterative building techniques, being people who research thoroughly and seek out reliable advice wherever they can. ASRA pledges that every effort will be made to assist these responsible people.

(l) ASRA also pledges that provided a newly constructed amateur-built gyroplane being presented for Pre-Listing evaluation and assessment meets the ASRA Gyroplane Construction Standards, then ASRA will undertake procedural fairness and not unreasonably withhold Acceptance and Listing of the machine.

Section 9

AMATEUR-BUILDERS MUST CAREFULLY NOTE THESE REQUIREMENTS AND EXPECTATIONS

General

9.01 History has shown that many people in the general community decide to build a gyroplane, independent of whether they have any previous aviation experience or are a member of ASRA or any other association. Most, in fact, have zero previous aviation experience. These “projects” usually come about because people read overseas magazines and pick up lots of ideas from today’s Internet. History also shows that much “information” about gyroplanes on the Internet is at best unreliable, and at worst dangerous.

9.02. History also shows that – usually – the first time ASRA becomes aware of the existence of such “projects” and “creations” is when the person contacts ASRA anticipating ASRA will simply “rubber-stamp” their machine and they can then fly.

9.03. Another common way ASRA becomes aware of gyro projects is when (as stated in earlier sections) people buy a “Gumtree Special” from a deceased estate, or as a “barn-find. These Gumtree Specials or “barn-finds” also result in people making contact with ASRA aspiring to quickly fly their machine, only to have their initial expectations “brought soberly down to earth” when they learn precisely what the requirements for ASRA Acceptance are.

ASRAs requirements and expectations of amateur-constructors

9.04. Decades of experience of handling the situations described above has enabled ASRA to develop the following requirements and expectations of homebuilders:

(a) An amateur-constructor must have average or above-average mechanical aptitude;

(b) An amateur-constructor must have, or have reliable access to, a wide variety of workshop hand and powered tools and equipment, such as:

(I) a good-sized well-lit warm and dry work area;

(II) sizeable, sturdy workbenches;

(III) general measuring tools such as a variety of rulers and tapes;

(IV) precision measuring tools such as vernier calipers, dial gauges and micrometers;

(V) a wide variety of clamps and other fixtures;

(VI) hand and power tools such as vices, drills, drill bits and files, hacksaws, metal cutting bandsaws and/or powered hacksaws, hand and bench grinders;

(VII) Soldering irons and electrical test equipment; and

(VIII) (ideally) lathes and mills.

Competence with tools and equipment

9.05. In addition to the equipment listed above, it must be recognized that it can easily take several years before a person is likely to become minimally competent with their tools and equipment.

9.06. Also, experience shows that even if a person becomes competent with any particular tool or item of equipment, it often takes more years to acquire the skill to effectively “plan” a sequence of steps using that particular tool or piece of equipment so that the part being constructed will be a success rather than a failure. This is sometimes known as a sequence failure.

Manufacturing or fabrication sequencing

9.07. An example of sequence failure is when a person doesn’t realize that although there might be three or four ways to manufacture a part, only one of those methods might result in a highly

precise and accurate part in the end. The most commonplace cause of failure is when an item being fabricated must be unexpectedly repositioned in a jig or clamp, which usually means that the precision measurements the constructor is aspiring for are lost and can never be precisely re-gained after the part is repositioned, no matter how much the constructor tries.

9.08. Similarly, if a part requires several individual manufacturing steps or processes in different clamps or jigs, it is entirely likely that measurement errors will compound on one another meaning that the end product may be out of tolerance in one or more ways and needs to be rejected.

Materials awareness

9.09. Another vitally important skill needed by a competent home-builder is the ability to identify and differentiate between different materials and different grades of materials, together with a good awareness of the differing characteristics, strengths and suitability of each material for the intended application.

9.10. Generally, good “materials awareness” takes a long time to acquire, with people involved in technical trades usually having a much better understanding than most others.

Information discernment and research

9.11. In this 3rd decade of the 21st Century, people have access to huge amounts of technical and materials information on the Internet. This was ***never*** the case in previous decades, particularly going back to the 1970s, 1980s, and 1990s. Modern-day constructors literally have a world of information at their fingertips.

9.13. But this enormous amount of available information gives rise to concerns about the RELIABILITY and ACCURACY of Internet information.

9.14. There are enormous numbers of “junk” sites on the Internet where unsubstantiated or outright false claims and assertions are made. Sadly, recreational aviation seems to be replete with unreliable websites and information.

9.15. Home-builders are **CAUTIONED** to be especially aware of the potential for misguided or even dangerous information to be posted on websites. Home-builders are strongly encouraged to deliberately confine their Internet research to reputable sites such as industrial, educational and government technical information sites and associated resources.

HOME-BUILDERS MUST CAREFULLY NOTE THAT BECAUSE HIGH-QUALITY TECHNICAL INFORMATION IS NOW FREELY AND READILY AVAILABLE ON THE INTERNET – ESPECIALLY RESOURCES SUCH AS ASRA’s GYROPLANE CONSTRUCTION STANDARDS – THAT ASRA WILL NOT ACCEPT IGNORANCE OF REQUIREMENTS AS AN EXCUSE.

ASRA THEREFORE ALWAYS RESERVES THE RIGHT TO ULTIMATELY REJECT ANY HOME-BUILT GYROPLANE PUT UP FOR ACCEPTANCE AND LISTING SHOULD THE QUALITY OF CONSTRUCTION BE DEEMED NOT TO BE IN ALIGNMENT WITH INDUSTRY BEST PRACTICE.

Section 10

HIERARCHY OF TECHNICAL MANAGEMENT OF ASRA ULTRALIGHT & LSA GYROPLANES

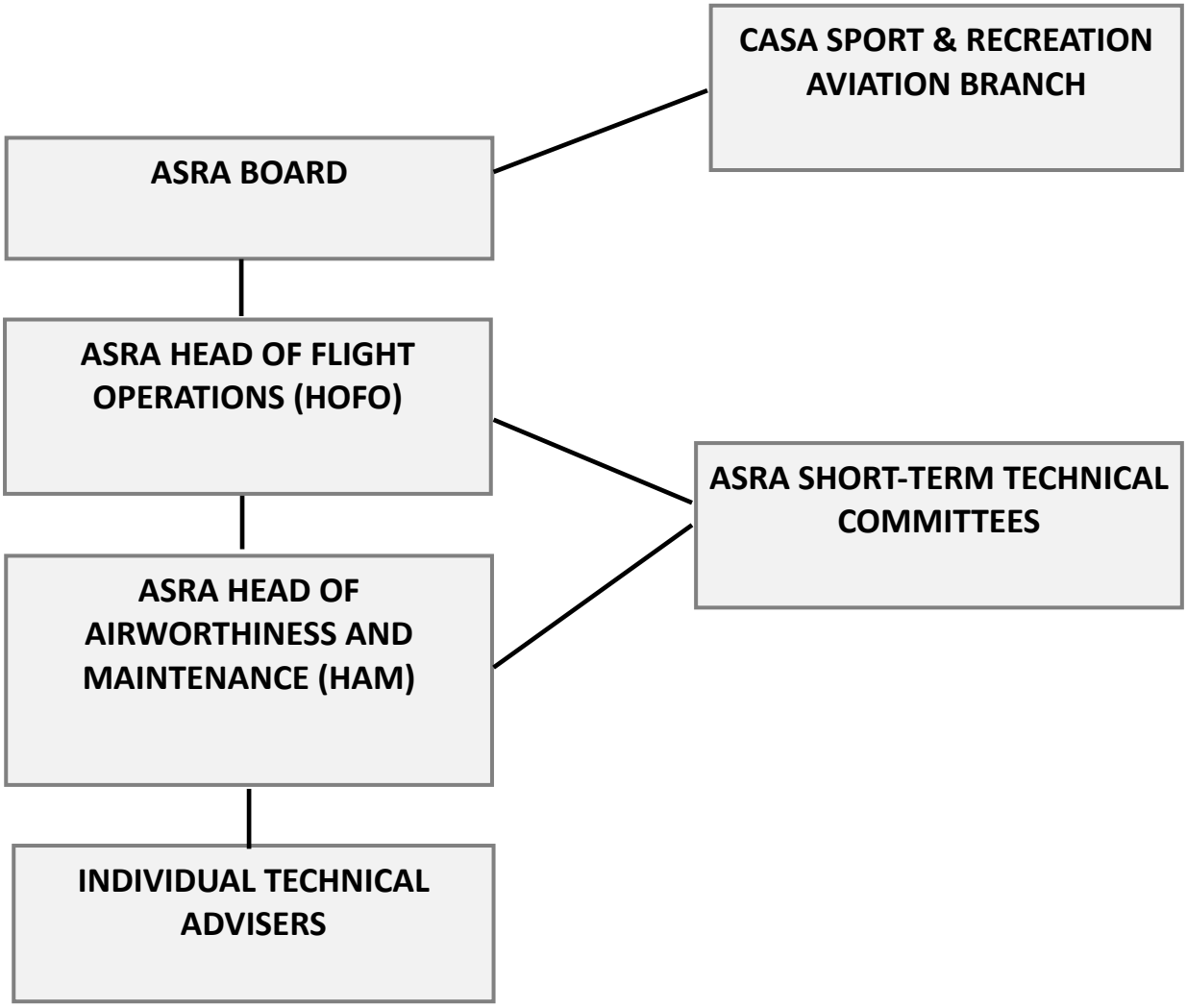


Figure 1

Explanation of Figure 1

10.01 ASRA is a small but well-respected organisation, with a generally good working rapport with CASA.

The "Hierarchy"

10.02 ASRA answers to the CASA Sport and Recreation Aviation Branch for gyroplane safety. The ASRA Board operates as the Executive of the Association, with usually the Operations Manager the CASR Part 149 "responsible person" so far as formal reporting to CASA is concerned.

Head of Airworthiness and Maintenance (HAM) (aka within ASRA as Technical Manager)

10.03 Reporting to the Operations Manager and also directly to the Board when requested, the HAM (aka Technical Manager) oversees all technical aspects of ASRA gyroplanes. See ASRA Administration Manual Position Descriptions (PDs).

Section 11

SHORT-TERM ASRA TECHNICAL COMMITTEES

11.01. Most Technical Adviser decisions are straightforward and uncomplicated: a gyro component or feature will either comply with ASRA Gyro Construction Standards or it won't.

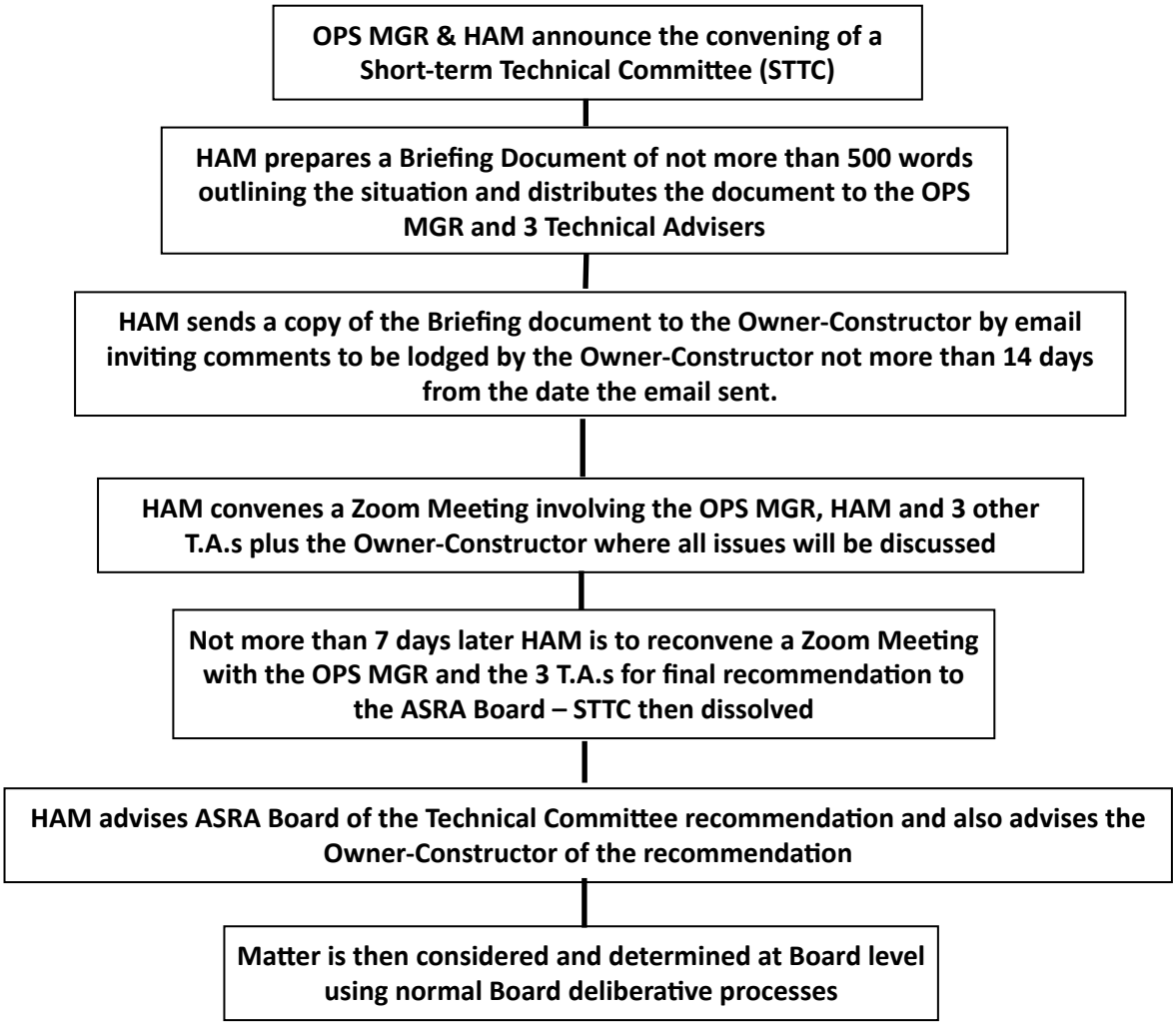
Novel or unusual features or components

11.02. Sometimes, a Technical Adviser will be confronted with a part, component, assembly, or feature of a gyro that is novel or unusual and may be difficult to evaluate for compliance or non-compliance with Construction Standards. Individual Technical Advisers are never expected to "stick their neck out" and make decisions they are not comfortable with.

11.03. When something novel or unusual comes up, the Technical Adviser should immediately consult other Technical Advisers or with the HAM. Often, the question of compliance or non-compliance can be worked through in consultation with the owner-builder, other Technical Advisers, and the HAM.

11.04. Occasionally, it will become apparent that a question of compliance or non-compliance can't be resolved through informal consultation. Examples of this are where there is a likelihood that legal action might be instigated if a gyroplane or gyroplane feature or component is ruled non-compliant, or where there are possible widespread safety or operational implications if a particular feature is allowed or not allowed. Other examples are variations on safety harnesses and restraints, etc.

PROCEDURE – ASRA SHORT-TERM TECHNICAL COMMITTEES



Section 12

ASRAs TECHNICAL ADVISERs & SENIOR TECHNICAL ADVISERs

12.01 ASRA's Technical Advisers (TAs) and Senior Technical Advisers (STAs) are a vital part of ASRA's System of Maintenance (SOM), providing support and advice to owner-builders; owners of commercially-produced gyros, and owners of 2nd-hand gyros/ They importantly act as impartial and watchful second "sets of eyes", using their greater levels of experience and skill to spot things that could be done better, or things that need fixing, and also will disallow things that might possibly lead to a serious and imminent risk to flight safety.

12.02 An ASRA Technical Adviser (TA) is functionally equivalent to an RAAus **L2** Maintainer, while an ASRA Senior Technical Adviser (STA) is equivalent to an RAAus **L4** Maintainer.

The Compulsory Inspections TAs and STAs undertake.

12.03 The involvement of a TA or an STA is **COMPULSORY** for the following processes to be completed:

1. **A PRE-INITIAL ACCEPTANCE AND LISTING INSPECTION OF ANY NEW GYRO (AMATEUR-BUILT OR COMMERCIALLY MANUFACTURED);**
2. **A "FIRST OF TYPE" PRE-INITIAL ACCEPTANCE AND LISTING INSPECTION OF ANY SERIAL-PRODUCED IMPORTED OR DOMESTICALLY MANUFACTURED GYROS SEEKING TYPE ACCEPTANCE;**
3. **POST-PURCHASE INSPECTION OF ANY 2ND HAND-GYRO;**
4. **POST-MAJOR MODIFICATION INSPECTION OF ANY GYRO; AND**
5. **POST-MAJOR DAMAGE REPAIR OR REBUILD OF ANY GYRO.**

IMPORTANT NOTE: A TA's or STA's "signoff" must be obtained by the builder, principal constructor and/or owner at the conclusion of these inspections. The ASRA Registrar WILL NOT process the Acceptance or Listing without a TA's or STA's signoff. The Owner always remains 100% legally responsible for the airworthiness of the gyroplane – TAs or STA's DO NOT certify the airworthiness of gyroplanes – rather, their role is to ensure gyroplanes comply with ASRA Gyroplane Construction Standards.

Other processes that TA's and STA's can **OPTIONALLY** undertake if they are available to do so.

12.04 ASRA TA's and STA's are authorised to also undertake the following processes, if requested to do so by a gyroplane owner:

1. **50-hourly inspections;**
2. **100-hourly inspections;**
3. **Annual Inspections;**
4. **any subsequent periodic inspections beyond the first 100 hourly or first Annual Inspection at the frequency dictated by the applicable System of Maintenance for any particular gyro specified in the Gyro Flight Manual; and**
5. **assisting with modifications and repairs.**

IMPORTANT NOTE: The Gyro Owner always remains 100% legally responsible for the airworthiness of their gyro. This means that it is the **OWNER** who signs of on the successful completion of any Urgent Maintenance or Periodic Maintenance on the ASRA Form F007 as well as in the Gyroplane Logbook. The Owner makes those entries when the TA or STA informs them that the procedure has been completed.

12.05 The specific roles of ASRA Technical Advisers and Senior Technical Advisers are:

1. **To provide advice and guidance, without fear or favour, to ASRA members about gyroplane technical matters;**
2. **To check gyroplanes being inspected for conformity with the relevant ASRA Gyroplane Construction Standard as well as against the need for gyroplane construction and workmanship to be of the highest quality reasonably attainable;**
3. **To impartially undertake inspections of gyroplanes when requested for initial Acceptance and Listing of a gyroplane (F024 Part A & FO22 Part B) and to countersign the documentation if satisfied the builder's representations are correct and that the gyroplane meets or exceeds the relevant Gyroplane Construction Standards (or to withhold initialling if the T.A. is not satisfied);**
4. **To cross-check post-flight and performance testing figures (F024 Part B and F022 Part B) and to countersign the documentation if satisfied if the builder's representations are correct (or to withhold initialling if the T.A. is not satisfied);**
5. **To verify that damage repairs and major modifications to gyroplanes are carried out competently and safely, restoring the gyroplane to compliance with the relevant Gyroplane Construction Standards and to verify this on the Form F006 'GYROPLANE REGISTRATION, MAJOR MODIFICATIONS, RENEWAL & TRANSFER FORM';**
6. **If necessary, to order a gyroplane grounded if the T.A. is of the view that the gyroplane has a deficiency that constitutes, contributes to, or may result in a serious and imminent risk to air safety; and**
7. **To undertake other duties as specified by the Head of Flight Operations Operations (HOFO) or Head of Airworthiness and Maintenance (HAM).**

<u>The legal relationship between Gyro Owner and Technical Adviser</u>

12.06 As stated in sub-para 12.04 (above) the Gyro Owner is and always remains 100% responsible for the safety and airworthiness of their gyroplane.

12.07 When a Technical Adviser attends to assess a gyroplane for compliance with Construction Standards, they DO NOT assume any legal responsibility for the gyroplane. Their sole job is to assess the gyroplane using their skill and experience against the gyroplane Construction Standards. They are not "**working for**" the Owner, but always will readily provide advice about whether the gyro or certain features of it comply of don't comply with Standards.

12.08 Technical Advisers are not Airworthiness Authorities – they simply assess a gyroplane against Construction Standards.

12.09 A **very important duty** a Technical Adviser has is to withhold initialling and signing-off the TA Declaration at the end of the F022 or F024, or the TA Section of the F006 **IF ANY FEATURE ON THE GYROPLANE DOES NOT MEET STANDARDS**.

<u>Why ASRA needs Technical Advisers</u>

12.10 ASRA strives to balance the competing considerations of freedom to design, build and operate recreational gyros without onerous restrictions with the obvious need to ensure that the gyro will be as safe as reasonably possible to operate.

12.11. A key element of this balancing process is the role of voluntary Technical Advisers.

12.12 The foundation principle for having 3rd party independent TA inspections is that it prevents a person from designing, building then attempting to fly a gyro completely on their own.

12.13 Technical Adviser inspection and countersigning is an important circuit-breaker in preventing

lone-wolf builders from attempting to get airborne in designs that may have serious deficiencies without the builder realizing or properly understanding the hazard or hazards.

The necessary personal qualities of a Technical Adviser

12.14 Technical Advisers are volunteers who have put themselves forward to the Board as persons having the capacity and willingness to assist other ASRA members in technical areas. Some have aviation engineering backgrounds, but most do not. Most do, however, have identifiable qualifications, skills or experience that are relevant to amateur aircraft construction.

12.15 Traditionally, TAs were required to have constructed a “successful gyro”, but because the number of homebuilders within our ranks is rapidly diminishing, this formerly essential pre-requisite has now been downgraded to “highly desirable.”

Required Competencies

12.16 All TA’s must be competent with:

(a) the ASRA Compliant and Basic Construction Standards;

(b) the ASRA Operations Manual;

(c) his ASRA Technical Procedures Manual;

(d) the ASRA Technical Notes;

(e) the FAA publication ‘Aircraft Inspection, Repair and Alterations’ (AC 43-13); and

(f) the CASR Part 103 Manual of Standards.

12.17 Increasingly, TAs are also required to know where to access manufacturer’s Flight and Maintenance Manuals on the Internet and to understand them thoroughly.

12.18 Many TA’s and STAs maintain extremely well-equipped home, farm or even commercial workshops. All are strongly encouraged to keep abreast of materials technology and evolving construction methods, and to particularly maintain high knowledge levels about materials and construction techniques used in gyros – aluminium alloys such as 2024, 5052 or 5053, 5083, 6061, 6106, and 7075 to name a few. Familiarity with the 6061-T6 extrusions commonly used in Australian gyroplanes is crucial.

12.19 Knowledge of Australian steel standards for tubes and square and rectangular hollow sections is highly desirable, as is knowledge of 4130 chrome-moly steel and stainless steels. Competence and experience in the use of composites is highly desirable, and ability to weld or comprehensive knowledge of welding is also highly desirable.

12.20 A wide knowledge of fasteners and their various applications is highly desirable. Fitting and machining skills are also very highly desirable.

12.21 The ability to research technical questions diligently and quickly is very highly desirable.

12.22 The capacity to judge good and bad workmanship, appropriate and inappropriate construction practices, and general fit and finish is also highly desirable. An ASRA pilot certificate is highly desirable. An ASRA Instructor’s Rating is not required.

12.23 In short, an ASRA TA should be a person with above average and widespread levels of technical knowledge in areas applicable to gyros. Therefore, they are likely to be a person recognized to be a bit of a “tech head”, above and beyond simply being a person who wants to fly gyros.

Emotional detachment and objectivity required.

12.24 The personality attributes required of a Technical Adviser are a positive attitude and a willingness to assist other members. Although most ASRA members are very collaborative and co-operative with their interactions with TA’s, ASRA nevertheless has some highly individual and very strong-willed characters in its ranks.

12.25 It is entirely conceivable that a TA might be roped-in to inspect a gyro that a member has spent many years and many thousands of dollars building. It is therefore highly likely that the builder will have very high expectations that their creation will be virtually “rubber stamped” and registered, and that they might be overly “emotionally invested” in their machine, and not be thinking objectively.

12.26 Such a builder is likely to be shocked, argumentative and obstinate when a TA says that they won't be able to countersign-off various features, or that the workmanship and/or fit and finish are not to required standards. In such circumstances patience, firmness and diplomacy are highly desirable skills.

12.27 While there is nothing wrong with a TA being a friend to the builder, it is crucially important for the TA to carry out their duties in a detached, impartial manner. A TA must NOT countersign for a builder where the TA's inner voice is telling them, "*No, don't do this*."

12.28 It is likely that a builder will attempt to be extremely persuasive in their desire to get the documentation countersigned, and the possibility of even a dispute breaking out clearly exists.

Accreditation processes to become a Technical Adviser

12.29 A person who has been a member of ASRA for not less than 3 years may apply to the Head of Maintenance and Airworthiness (HAM) expressing their interest in undertaking the ASRA 3-month Technical Adviser distance-learning course (administered by the HAM).

12.30 The Expression of Interest email MUST include:

(a) Name, address and ASRA membership details and certificates and ratings held;

(b) an explanation of the reasons why the member is motivated to acquire the TA accreditation;

(c) a pledge that the member is willing to make themselves available to assist other ASRA members in technical matters and to faithfully and impartially undertake inspections without favour or prejudice;

(d) a detailed description of any particular technical, mechanical and electrical skills, qualifications and experience the member has previously acquired;

(e) an emphasis on any pre-ASRA or current non-ASRA aviation experience the member may have, especially in aircraft engineering (whether civilian or military); and

(f) any special skills the member thinks might be especially relevant to, or useful for ASRA.

12.31 If an ASRA member already has a CASA LAME Licence or has acquired such a licence within the first 3 years of their ASRA membership, the 3-year membership pre-requisite will not apply to that member, although they will still be required to do the ASRA 3-month TA distance learning course.

TA Course and Examination.

12.32 The 3-month ASRA TA distance-learning course focuses on the publications listed in paragraph 12.16 (above) and culminates with the candidate sitting a 50-question multiple-choice examination where 80% is the required pass mark.

Senior Technical Advisers (STAs)

12.33 An ASRA member who successfully undertakes the ASRA Technical Adviser 3-month Distance Learning Course and passes the Technical Adviser's exam, and who also possesses a current CASA LAME Licence, will be appointed as a Senior Technical Adviser because they possess that credential. A STA is the equivalent of an RAAus L4 maintainer.

12.34. If a person has a current CASA LAME Licence, then it will be more likely than not that they are professionally involved in aviation as a living or on a part-time basis. It is important to remember, however, that from the outset, they will have joined ASRA as a volunteer member of a not-for-profit incorporated association constituted to promote the use of Ultralight Gyroplanes in sport and recreational aviation.

12.35 Therefore, their ASRA membership is that of a volunteer member of recreational aviation organisation, and not so much as an official holding a CASA LAME Licence. What this means is that ASRA will not impose any special burdens or expectations on them, notwithstanding they have professional qualifications.

12.36 However, the fact that they are titled a Senior Technical Adviser (which means they are also a LAME) may be attractive to some ASRA members who desire to have their gyroplane inspected or worked on by someone who is an aviation professional. If this is the case, then that ASRA member should bear in mind that the only time an STA might have available is during their normal business hours, in which case if the ASRA member is seeking servicing, modifications and repairs, then the STA will be entitled to negotiate a fee for his services with the member.

Promoting an Evidence-Based Culture

12.37 Over the past decade ASRA has transitioned to having an evidence-based culture, rather than an opinion-based culture so destructively prevalent in other clubs and associations. While everyone is naturally entitled to have an opinion, ASRA now requires that when anything controversial arises, that parties involved in the controversy set about researching the topic as thoroughly as they possibly can, with a view to then making evidence-based arguments and submissions.

12.38 This has the benefit of making the controversy topic-based rather than personality-based (i.e., playing the ball and not the man). It also tends to promote a more disciplined and civil approach to contentious topics. Procedural fairness is also an important additional consideration.

12.39 An evidence-based culture requires focus on clear and concise communication, as well as good record-keeping and keeping extensive high-quality photographic records.

Promoting a Culture of Technical Consultation

12.40 Although Technical Advisers are spread thinly and widely throughout Australia, ASRA strongly encourages regular consultation between TAs and other experienced members, as well as consultation where necessary with the HAM (Technical Manager) or the AHAM (Assistant Technical Manager).

12.41 If a TA has encountered a situation he has not encountered before or is not completely sure about how to handle a situation, then the HAM (Technical Manager) needs to be consulted. This step will protect the interests of the TA as well as enhancing the information flow to the ASRA Executive about developments that are occurring.

12.42. For some years it has been the practice of the ASRA “Technical Team” to consult very widely when sorting out technical issues. This has included the empanelling of technical committees on an “as required” basis, or utilizing ATSB services, or consulting with specialist testing agencies for chromatographic and metallurgical testing and for surface hardness and tensile strength testing.

TA’s must take multiple photographs of items of concern for recording and notification purposes

12.43 Given that nowadays almost everyone has a smartphone fitted with a high-quality camera sitting in their pocket, there is absolutely no excuse for not taking a comprehensive set of photos for forwarding to the Technical section. For example, if a TA is reporting on a failure or describing damage, it is expected that not less than 6 photos will be supplied.

12.44 The photos must range firstly from a photo of the entire machine as no 1, then progressively move closer to the relevant part or area in photos 2 to 3. These introductory photos provide the necessary context for the following close-up photos. Photos 4, 5 and 6 are then expected to be close-ups of the part of interest taken from different angles. 6 is therefore the minimum number of photos expected – but you are encouraged to send many more if you want.

12.45 Any technical notification made from now on without the forwarding of multiple photographs will be regarded as inadequate and insufficient.

TA’s and “Out-of-Pocket Expenses”

12.46 Because TA’s are rendering a valuable and essential service to gyro builders and gyro owners, any expenses associated with a TA’s inspection are expected to be borne by the builder / owner. This includes mileage, accommodation, and travel expenses.

12.47 In keeping with the general voluntary ethos of a recreational incorporated association, a TA should not see their accreditation as a TA as a money-making credential beyond the reimbursement of out-of-pocket expenses. Ordinarily, it is expected TA's will not charge a fee for an inspection or inspections involved in Forms F006, F022 and F024. However, if a TA's involvement with a builder or owner goes beyond inspections, such as when the flight evaluation processes involved with the F022(b) and F024(b) are involved, and where specialist equipment might be needed for accurate data collection and the TA has that equipment, then the TA can negotiate in advance with the builder or owner that a fee might be necessary for the specialist skills and equipment involved.

12.48 In general, most builders and TAs enter into arrangements where the expenses to the builder are minimised, usually by the builder transporting the gyro to a convenient place to the TA, or taking it to a place where the TA will be.

TAs and Conflicts of Interest

12.49 A TA needs to be mindful to avoid conflicts of interest. A conflict of interest will arise where a TA has a financial or proprietary interest in the gyroplane under assessment. The general principle to be followed is that TAs are not permitted to sign-off their own machines (although STAs are allowed to do so due to their LAME accreditation). TA's must therefore arrange for an independent TA to do signoffs on any gyroplane they own.

Section 13

ASRA's TECHNICAL KNOWLEDGE UPSKILLING PROGRAM

ASRA's mid-2021 unilateral approach to NSW TAFE for technical and further education

13.01 In mid-2021 the ASRA Operations Manager and Technical Managers approached NSW TAFE, a CASA-approved CASR Part 147 Maintenance Training Provider.

13.02 This approach was made by ASRA as the Technical Manager at that stage was involved in the CASA Part 103 Technical Working Group and was wanting to devise a way for ASRA members to better adapt to the expectations of CASR Part 103.

Some aspects of the soon-to-be-implemented CASA CASR Part 43 were considered useful.

13.04 CASA has for some years been developing a system of maintenance appropriate for the maintenance of VH-registered aircraft engaged in private and aerial work operations.

13.05 CASR Part 43 will not have any application to Part 103 aircraft, but nevertheless ASRA considers that some proposed aspects of the Part 43 system of maintenance are particularly suitable for ultralight owners.

13.06. The draft Part 43 places emphasis on an accreditation to be known as 'Aircraft Maintenance Technicians' (AMTs) which will have Certificate levels, namely:

(a) AMTC 1 CASA defined

(b) AMTC 2 Experimental Aircraft Builder

(c) AMTC 3 Inspection Amateur-built and Light Sport Aircraft

(d) AMTC 4 Light Sport Aircraft – Maintenance

(e) AMTC 5 Special (for maintainers of limited category aircraft)

The AMTC 3 and 4 accreditations

13.07 The CASA AMTC 3 accreditation for VH-registered amateur-built aircraft will involve at least 16 hours of instruction in the performance of an annual inspection on the aircraft or type of aircraft for which the Certificate is to be issued.

13.08 The CASA AMTC 4 accreditation for VH-registered amateur-built will involve a training course of at least 120 hours duration relating to the maintenance, preventive maintenance and modification of the aircraft or type of aircraft for which the Certificate is to be issued.

Applicability to ASRA's circumstances

13.09 Being mindful these Part 43 initiatives are not applicable to Part 103 ultralight aircraft, ASRA nonetheless considers that the AMTC 3 and AMTC 4 accreditations can be used to provide a kind of framework that might be useful to CASR Part 103 aircraft, if adapted specifically to ultralight aircraft and to the needs of recreational ultralight aviators.

ASRA / RAAus collaboration with NSW TAFE Aviation Department is ongoing.

13.10 In late 2021 RAAus announced that they would be joining in with the ASRA-NSW TAFE training initiatives.

13.11 At time of writing (October 2023) plans for an Ultralight Maintainer's Course starting sometime in 2024 are under consideration.

PART 2

PROCEDURES

Section 14

GYROPLANE ACCEPTANCE AND LISTING – GENERAL PRINCIPLES

Section 15

BASIC ULTRALIGHT GYROPLANES (SINGLE-SEAT) – ACCEPTANCE AND LISTING PROCEDURES

Section 16

BASIC ULTRALIGHT GYROPLANES – TRANSFERS OF LISTING

Section 17

NEW 2-SEAT (AND HEAVIER SINGLE-SEAT) **AMATEUR-CONSTRUCTED GYROS** ASSESSED UNDER THE COMPLIANT CONSTRUCTION STANDARD – ACCEPTANCE AND LISTING

Section 18

NEW 2-SEAT (AND HEAVIER SINGLE-SEAT) **COMMERCIALLY-MANUFACTURED GYROS** ASSESSED UNDER THE COMPLIANT CONSTRUCTION STANDARD – ACCEPTANCE AND LISTING

Section 19

2-SEAT AND HEAVIER SINGL-SEAT GYROPLANES ASSESSED UNDER COMPLIANT CONSTRUCTION STANDARDS – TRANSFERS OF LISTING BETWEEN ASRA MEMBERS

Section 20

RE-ACCEPTANCE AND RE-LISTING OF COMPLIANT GYROS THAT HAVE BEEN SUBSTANTIALLY RE-BUILT AFTER ACCIDENT OR HYBRIDIZATION + COMPLIANT GYROS THAT HAVE BEEN LISTING-LAPSED FOR OVER 3 YEARS

IMPORTANT NOTICE TO ASRA MEMBERS

During the period 2022 to 2024 ASRA will be transitioning from operating under the CAO 95-series "Exemptions" (in place since 1977) to operating under dedicated Regulations that do away with the concept of "Exemption".

This means that the new governance scheme involves the implementation of Regulations that impose positive rights, duties and obligations, both on individual pilots and Recreational Aviation Organisations.

ASRA's operations will in future be governed by, or affected, by Civil Aviation Safety Regulations (CASR) Parts 61, Part 103, Part 138, and Part 149 (amongst others).

In general, one main effect is that ASRA's administrative processes will become more identifiably aligned with established general aviation practices, although ASRA is also determined that operating costs and outlays borne by the recreational flyer will remain minimized.

TERMINOLOGY CHANGES

(1) ASRA will no longer "register" gyroplanes. This terminology is being abandoned to prevent confusion with general-aviation and commercial-aviation aircraft that are on the national "VH" register.

(2) From 2023 ASRA will instead "Accept" and simultaneously "List" gyroplanes, "Acceptance" meaning that the gyroplane has been assessed as meeting the relevant ASRA Gyroplane Construction Standards. "Listing" means that the gyroplane will be Listed on the records of the Association and an annual adhesive credit-card-size "Listing Placard" will be issued for sticking to the mast.

(3) CASA requires that in future ASRA keeps better track of the gyroplanes on its books, particularly in relation to establishing an audit trail for monitoring Listed gyroplanes as well as for their periodic maintenance, damage repair and rebuilding.

(4) ASRA has therefore adjusted its technical administrative processes slightly to better conform to CASA guidelines.

ASRA "LISTING" TERMINOLOGY

"LISTED"

means a gyroplane that has been Accepted by ASRA as complying with Gyroplane Construction Standards and consequently Listed on what was previously known as ASRA's gyro register. This results in either 'provisional' Approval to fly, or 'full' approval to fly (at the owner's own risk).

"LAPSED LISTING"

means a gyroplane previously listed for which the annual registration fee remains unpaid, which means the gyroplane cannot be flown until the renewal is fully paid.

"DE-LISTED"

means a gyroplane that was previously Listed being removed from the ASRA List because both it and its Owner **left ASRA completely** by non-renewal of Listing and Membership, **OR** if a spare gyroplane always in the custody and control of a current paid-up ASRA member has lain dormant Listing-unpaid for more than **36 months**.

Section 14

OVERVIEW OF CHANGES

ASRA GYROPLANE LISTING AND MAINTENANCE PROCESSES

CASA Expectations

14.01 As explained in preceding sections, ASRA and some other recreational aviation organisations are being "transitioned" from operating under legislative Exemptions over to operating fully under Australian civil aviation legislation and regulations, albeit adapted to make some allowances for the lower-cost recreational aviation environment.

14.03 CASA's CASR Part 103 essentially replaces the Exemptions and imposes significant additional expectations and requirements on Aviation Self-Administering Organisations (ASAOs) such as ASRA.

Formal Maintenance Requirements within civil aviation for private owners

14.04 CASA's Part 103 contains a lot of cross-references to maintenance requirements used in general-aviation. These maintenance requirements can be traced back to the U.S. Federal Aviation Administration (FAA) which is the international leader in civil aviation administration and regulation.

14.05 In recent decades Australia's CASA has been making substantial efforts to "harmonise" Australian aviation processes with those of the U.S., including the wholesale adoption of many FAA provisions into Australian civil aviation law.

The main two Part 103 maintenance requirements

14.06 The two main CASR Part 103 requirements imposed on ASAOs such as ASRA are:

(a) **ANNUAL INSPECTIONS; and**

(b) **100-hourly inspections for Part 103 aircraft engaged in training or certain air work activities (for ASRA, this means aerial mustering).**

ANNUAL INSPECTIONS

14.07 In Australia, before World War 2, civil light aircraft periodic inspections - beyond daily inspections - were tied in with a 6-month duration of Certificates of Airworthiness, meaning a 6-monthly inspection was necessary to get a new Certificate. Pre-war, Australia looked to Great Britain as the model for civil aviation regulation and administration.

14.08 In 1944, the six-monthly requirement was changed to **12-monthly**, bringing Australia into line with the U.S. which was the leader in founding the International Civil Aviation Organisation (ICAO), most famous for the influential "Chicago Conference" of 1944 which set the foundations for post-war civil aviation resurgence.

14.09 This **Annual Inspection** requirement continues to the present day and is a major consideration in the operation of general aviation aircraft, in Australia, in the United States, the United Kingdom, and most other ICAO "contracting states".

14.10 ASRA's new requirements for Annual Inspections is covered more extensively in Section 35 of this Manual, but for present purposes all the reader needs to know is that ASRA is introducing them as an important addition to ASRA Technical Administration under CASRs Part 103 and 149.

Maintenance Releases (soon to be called '**Release to Service**')

14.11 In general aviation, the continuing airworthiness of an aircraft is verified by the aircraft having a certificate of airworthiness (CofA) and a current Maintenance Release (CASA CAAP 43-1 and Form 918).

14.12 CASA Maintenance Releases are valid for **12 months**, on the basis that upon the successful completion of an Annual Inspection, a Maintenance Release will be created by the approved person doing the inspection.

14.13 With its CASR Part 103, CASA is imposing expectations on recreational ultralight aviation that maintenance processes used on Part 103 recreational and ultralight aircraft broadly follow long-established and well-understood general-aviation procedures.

14.14 Under Part 103, CASA is not imposing the full gamut of formal certification requirements on Part 103 ultralight recreational aircraft (i.e. – those applicable to conventional certified light aircraft on the national "VH" register).

14.15 Instead, CASA has provided that ASAOs can – within limits - devise Acceptance, Listing and Maintenance schemes appropriate to, or tailored to, the particular class or classes of aircraft each ASAO administers under their CASR Part 149 Expositions.

14.16 The clear CASA Expectation, however, is that the ASAO processes will broadly run along the lines of the well-settled and well-understood Annual Inspection and Periodic Inspection regimes so familiar to everyone in general aviation.

The new ASRA Form F007 – 'Release to Service' and Form F008 'ASRA DAILY INSPECTION CERTIFICATIONS AND AIRCRAFT TIME IN SERVICE SHEET FOR REALEASE TO SERVICE RECORDS'

14.17 To comply with the CASA requirement to upgrade maintenance-related documentation, ASRA has devised the Form F007 'Release to Service', which operates similarly to a general-aviation Maintenance Release. The new ASRA Form F008 is devised to assist Owners to record and track their recent gyroplane flying, total accrued time in service, names of occupants, and number of landings.

14.18 A key aspect of the F007 is that it is the gyroplane **Owner**, who prepares and signs the document, rather than an aircraft maintenance engineer.

14.19. **What the F007 'Release to Service' document is, and what the F008 'Daily Inspection Certification and Time in service' is, and how to use them, is fully described at Section 31 of this Manual.**

14.20. For the current purposes of this Section, it is sufficient to know that ASRA is implementing the 'Release to Service' and its associated 'F008 Daily Inspection certifications and Aircraft Time-in-Service sheets' as part of its effort to upgrade technical processes to conform to CASA's CASR Part 103 and 149.

100-hourlies for 2-place gyros used for training and single-place mustering gyros

14.21 This is a standard requirement in general aviation and much of recreational aviation. The 100-hourly requirement recognises that training and mustering machines are likely to be used much more intensively than a gyroplane solely used by a single owner for private purposes.

14.22 The requirement for training gyroplanes to have 100-hourlies also recognises the extra duty of care owed by the instructor to the safety and welfare of students.

14.23 The mustering gyro 100-hourly requirement is more a recognition that mustering machines are used intensively and tend to lead "hard lives" in the unforgiving environment of low and slow flight with lots of maneuvering. More information on the 100-hourly requirement is included later in this Manual at Section 35.

14.24

POINTS TO CONSIDER WHEN PLANNING YOUR GYRO'S MAINTENANCE PROGRAM

1) ASRA'S MEMBERSHIP AND GYROPLANE LISTING RENEWAL RUNS ON A CALENDAR YEAR BASIS (1 JAN TO 31 DEC).

2) ASRA CONSIDERS THAT IT IS LIKELY THAT THE AVERAGE RECREATIONAL PRIVATE GYRO OWNER WHO ISN'T AN INSTRUCTOR AND WHO DOESN'T DO AERIAL MUSTERING MAY ONLY ACCRUE BETWEEN **25 TO 75 HOURS** PER YEAR, SO THE ANNUAL INSPECTION IS LIKELY TO BECOME THE MAJOR INSPECTION PROCESS IN ANY YEAR.

3) A GYRO OWNED BY AN INSTRUCTOR OR A GYRO USED FOR AERIAL MUSTERING IS LIKELY TO BE ACCRUING HOURS MUCH MORE RAPIDLY, WITH BUSY INSTRUCTORS POSSIBLY DOING **SEVERAL HUNDRED HOURS**, AND AN AERIAL MUSTERER **IN EXCESS OF 500 HOURS** IN A YEAR, SO IN THEIR CASES THE 100-HOURLIES BECOME THE MAIN INSPECTIONS. AN OWNER MAY CHOOSE TO ROLL A 100-HOURLY IN WITH THE ANNUAL INSPECTION BUT NOTE THAT EACH TYPE OF INSPECTION HAS DIFFERENT FOCUS AND EMPHASIS AND BOTH CHECKLISTS NEED TO BE COMPLETED.

4) ALTHOUGH CASA DOES NOT SPECIFY WHEN AN ANNUAL INSPECTION SHOULD BE DONE (APART FROM ONCE A YEAR), ASRA SUGGESTS THAT THE PERIOD **SEPTEMBER TO NOVEMBER SEEMS LOGICAL, TO ALIGN WITH ASRA'S LISTING RENEWAL CYCLE.**

5) AS FROM 1 NOVEMBER 2023 RENEWING THE LISTING OF YOUR GYRO WILL INVOLVE ENTERING DETAILS OF THE GYRO'S ANNUAL INSPECTION INTO THE ASRA DATABASE BEFORE THE SYSTEM WILL ACCEPT PAYMENT FOR RENEWAL.**A SAMPLE OF THE DATABASE ANNUAL INSPECTION TEMPLATE IS SET OUT ON THE NEXT PAGE.**

6) ASRA'S FORM F007 'RELEASE TO SERVICE' DOCUMENT IS ONLY VALID FOR **12 MONTHS** (SAME AS A CASA MAINTENANCE RELEASE), SO IT IS UP TO YOU WHEN YOU DO YOUR "ANNUALS", BEARING IN MIND THE F007 HAS A **12-MONTH** VALIDITY PERIOD.

7) IF YOU BUY, OR SELL, A GYRO PART WAY THROUGH ANY YEAR, THE SELLER'S RELEASE TO SERVICE EXPIRY DATE IS TO BE TRANSFERRED OVER TO A NEW RELEASE TO SERVICE CREATED BY THE BUYER, SO THAT THE 12-MONTH ANNUAL INSPECTION EXPIRY IS NOT EXCEEDED. THE NEW OWNER CAN THEN CHOOSE TO UNDERTAKE AN EARLIER ANNUAL INSPECTION IF HE WANTS.

8) AS A GYRO OWNER, YOU REMAIN SOLELY RESPONSIBLE FOR THE SAFETY AND CONTINUING AIRWORTHINESS OF YOUR MACHINE AT ALL TIMES.

9) YOU ARE ENTITLED, **AS THE OWNER**, TO UNDERTAKE MAINTENANCE, SERVICING, MODIFICATION AND REPAIRS OF YOUR GYROPLANE TO THE EXTENT DETAILED IN THE "ASRA MAINTENANCE AUTHORISATION TABLE AT SECTION 27, PAGE 106 OF THIS MANUAL, AS WELL AS GENERALLY DESCRIBED WITHIN PARTS 3 AND 4 OF THIS MANUAL.

Sample ASRA Database ANNUAL INSPECTION details entry screen

ASRA DATABASE – GYROPLANE ANNUAL LISTING RENEWAL PROCESS
DETAILS OF MOST RECENT ANNUAL INSPECTION UNDERTAKEN

Name and ASRA membership number GYRO NUMBER

I have owned the gyroplane continuously since last year's renewal **Y / N** **or**

I acquired the gyro during the year from

I am relying on the previous owner's FOO7 expiry date, which is:

- OR –

DECLARATION: I completed the **ANNUAL INSPECTION** on the gyro at

Insert date of completion of **ANNUAL** and signing of 'Release to Service

THE SYSTEM OF MAINTENANCE (S.O.M.) BEING USED ON THE GYRO IS:

CASA Audit and Surveillance Requirements ASRA Members **NEED TO BE AWARE OF**

14.25 With ASRA transitioned to regulation under CASA CASRs Parts 103 and 149, ASRA members need to be aware of their increased responsibilities concerning maintenance record-keeping.

14.26 Regulation 149.275 of the Civil Aviation Safety Regulations (CASR) imposes on ASRA a requirement to develop and incorporate an audit and surveillance system into its foundation Part 149 documents, known as the "Exposition".

14.27 '***Auditing***' is a commonly understood expression and covers the formal conducting of a close inspection of records and processes, usually by an external skilled entity or authority.

14.28 '***Surveillance***' is the monitoring of adherence to safety and regulatory standards of participants in the aviation system, usually by an external skilled entity or authority.

14.29 CASA requires each ASAO such as ASRA to have 'an effective audit and surveillance system to assess the safety performance of authorisation-holders, including their ability and willingness to comply with ASRA's procedures and requirements and civil aviation legislation and regulations.

14.30 CASA periodically audits and undertakes surveillances of ASRA at Executive level. ASRA will therefore need to, from time to time, undertake audits and surveillance of Instructors and members to determine their compliance with processes, procedures and record-keeping. For instructors, this will involve physical attendance by the HOFO or their nominee upon individual Instructors to review instructional technique, methods, and record-keeping, and for any member holding any form of ASRA maintenance authorisation, review by the HAM or his nominee into the member's maintenance methodology and record-keeping.

14.31 For ordinary members, auditing and surveillance is more likely to involve requirements that the member scan and email specific records back to ASRA.

14.32 Further information on CASA audit and Surveillance requirements for ASRA and other ASAOs can be found at **CASA Advisory Circular AC 149-01.0 'Approved Self-Administering Aviation Organisations, (April 2021), Appendix B 'Audit and Surveillance guidance' (79 pages).**

Section 15

GENERAL INFORMATION APPLICABLE TO ALL ASRA GYROPLANES ABOUT "ACCEPTANCE" & "LISTING"

ASRA GYROPLANE "ACCEPTANCE"

ASRA GYROPLANE "TYPE ACCEPTANCE"

"LISTING" NOW REPLACES REGISTRATION

PROVISIONAL AND FULL APPROVAL TO FLY

40-HOUR "FLYOFFS" FOR CERTAIN NEW MACHINES

"FIRST-OF-TYPE" PROTOCOLS FOR DOMESTIC OR IMPORTED GYROPLANES IN SERIAL PRODUCTION BY A MANUFACTURER

5-HOUR "SHAKEDOWNS" FOR GYROPLANES FOR WHICH TYPE ACCEPTANCE HAS PREVIOUSLY BEEN GRANTED

"Acceptance" of gyroplanes for "Listing"

15.01. For ASRA purposes, once a gyroplane has been "Listed" it has also been "Accepted". This simultaneous additional classification has implications under CASR Part 103.

Who can apply for "Listing" a gyroplane?

15.02. Gyroplanes can be Listed either in the name of a human aged 18 years or over who is also a current financial member of ASRA, or by a company (usually a pastoral company), the company's application being signed by an officer or employee aged 18 years or over who is also a current financial member of ASRA.

Listing (previously known as registration)

15.03. For ASRA purposes, once the Registrar has:

(a) Issued an airframe number and Listing number;

(b) processed the ASRA Form F022 or F024 into the ASRA electronic database; and

(c) Issued a receipt evidencing payment of the Listing fee;

…. then the completion of those processes has the practical effect of also being the issuing of ASRA's Provision Approval to Fly.

15.04. The owner can then consider the gyroplane **Listed** for the purposes of CASR Part 103.

Listing (Provisional)

15.05. Because the final performance figures of a gyroplane will not be known at the time of initial Listing, for internal ASRA purposes, the initial Listing is classified as 'Listing (Provisional)'.

15.06 This classification signifies that although the gyroplane has been fully Listed for CASR Part 103 purposes, the completed Flight Manual for the gyroplane has not yet been fully compiled or completed because actual performance figures for the gyroplane need to be progressively acquired and recorded during the flyoff period of the gyroplane.

15.07. Once all of the required performance figures for the gyroplane have been determined or established and entered into the ASRA electronic database file for that gyroplane, and the Flight Manual entered into ASRA records, the ASRA Registrar will remove the '(Provisional)' classification, and Full Approval to Fly will automatically commence.

New Builds

15.08.ASRA classifies a candidate gyroplane as a “new build” if the gyroplane has a frame that has primarily been constructed from new materials and which has never previously been allocated an airframe number by ASRA or previously been on the ASRA register or List.

15.09.It should be noted that it is commonplace for serviceable components of previously registered or previously Listed gyroplanes to be carried over and incorporated into new builds. This practice is acceptable, provided the carried-over components are “serviceable”.

Second-hand (2nd-hand)

15.10.A gyroplane is 2nd-hand if it has been bought as parts or a complete machine by a person who is not the original principal constructor of builder of the gyroplane. Most gyroplanes administered by ASRA are “2nd-hand”.

Type Acceptance

15.11.For ASRA purposes, ASRA will acknowledge and accept a gyroplane as a “Type” if:

(a) the gyroplane is currently under serial production of identical copies, with variances only a consequence of customer ordering and preferences (such as instrumentation fit-out or whether supplementary fuel tanks are installed);

(b) that the manufacturer has distributed not less than five (5) of these identical design gyroplanes into either a domestic or the international open market; and

(c) that either singly or in combination, the accumulated time-in-service of these identical design gyroplanes has exceeded 1000 hours without mishap or accident.

15.12. If a gyroplane design being put up by a manufacturer for ASRA Type Acceptance has already achieved previous Acceptance in the U.K. under CAP 643 – British Civil Airworthiness Requirements, Section T – Light Gyroplanes, then the importer does not need to satisfy sub-paras (a), (b), and (c) [above].

15.13. It must be noted, however, that U.K. Acceptance under CAP 643 BCAR-T does NOT automatically guarantee ASRA “rubber stamp” Acceptance or Type Acceptance. The candidate imported Gyroplane will still be required to undergo Assessment against the ASRA Gyroplane Construction Standards as detailed elsewhere in this Manual.

15.14. If a gyroplane has achieved “ASRA Type Acceptance”, then the process of Acceptance and Listing for subsequent identical copies being imported is much easier, because the “First-of-Type Protocols” will already have been complied with.

Provisional Approval to Fly

15.15. Once a candidate gyroplane has been subjected to a full TA assessment against the ASRA Gyroplane Construction Standards and has passed that assessment, provided the importer or principal constructor has satisfactorily filled out all of the ASRA Form F022 Acceptance and Listing documentation, and paid the appropriate fee, the ASRA Registrar will make electronic ASRA database entries that have the legal effect of being:

(a) ASRA Acceptance of the candidate gyroplane as being suitable for Listing;

(b) an ASRA Certificate of Listing will issue (usually an adhesive sticker) for adhesion to the gyroplane mast; and

(c) ASRA’s Provisional Approval to Fly. The precise status of ASRA’s Provisional Approval to Fly is that ASRA is not in any way certifying or vouching for the airworthiness of the gyroplane, but rather means: “…..ASRA has have closely examined your candidate gyroplane, and it is compliant with our Gyroplane Construction Standards. Therefore, ASRA will not stand in your way any further should you desire to fly this machine at entirely your own risk.” This also has the status of being a CAO 95.12.1 (5A) ‘**SAB Flight Permit’.**

NOTE VERY CAREFULLY

15.16 ASRA's Provisional or Full Approval to Fly automatically **CEASES** if any of the following occurs:

(a) the Listing renewal fee due no later than 11.59pm on 31 December each year has not been received and processed by the ASRA Registrar;

(b) for any period of time after 12am on 1 January each year that the Listing renewal fee remains unpaid into the New Year;

(c) if the gyroplane has been involved in an incident where the rotor has struck any object while ground taxying or where the rotor has sustained actual physical damage in a hangar-rash incident, or where the rotor is showing signs of corrosion or noticeable deterioration, or ANY cracks, splits or de-lamination (Incident Report MUST be promptly filed);

(d) if the gyroplane has been involved in a hard hard-landing or take-off or landing tip-over accident, where the rotor struck the ground or any other object, damaging the rotor, or where the airframe, keel, mast, or tail surfaces have been either damaged or noticeably distorted (Accident Report MUST be promptly filed);

(e) if an ASRA Technical Adviser has directed that the gyroplane is not to fly until a defect has been rectified; or

(f) if the ASRA Head of Flight Operations (HOFO) or Head of Airworthiness and Maintenance (HAM) has directed that the gyroplane is not to be flown until a defect has been rectified and compliance to Construction Standards restored.

ASRA'S FLIGHT ENDURANCE EVALUATION FOR NEW AMATEUR-CONSTRUCTED OR FIRST-OF-TYPE COMMERCIALLY-MANUFACTURED GYROPLANES

15.17 ASRA's Gyroplane Construction Standard E20 specifies as follows:

'E20 Flight Endurance Evaluation

(a) It shall be confirmed by flight evaluation that the proposed powerplant and rotor system limitations are compatible with the satisfactory functioning of the system over the proposed range of operating conditions and flight envelope.

(b) A 40-hour flight endurance evaluation shall be conducted on a provisionally-Listed gyroplane, to demonstrate the following:

(i) the gyroplane must not experience any significant problems or failures during the endurance evaluation;

(ii) the endurance evaluation must be conducted to a flight schedule which is representative of operational use;

(iii) any problems or failures which occur must be resolved and extra flight evaluation conducted until 40 hours of trouble-free operation has accrued;

(iv) development flying time may be counted towards the 40 hours of endurance evaluation, provided the gyroplane is in the final configuration and the evaluation flying was representative of operational use; and

(v) in any particular case, the Head of Flight Operations (HOFO) and the Head of Airworthiness and Maintenance (HAM) - deciding jointly - may vary the 40-hour period by either reducing or increasing the hours after undertaking a risk-based review of the circumstances that exist with the subject gyroplane at the time.

NOTE: The 40-hour Flight Endurance Evaluation is commonly known as a "Flyoff", and "Flyoff" will be the term used throughout this Manual.

NOTE: If, during the 40+ hour Flyoff period, a malfunction occurs that necessitates an emergency landing, then the emergency landing is to be reported as a Incident and the 40+ hour period re-sets to begin again after the malfunction has been rectified.

Carriage of a 2nd occupant during Flyoff periods is not permitted

15.18 New amateur-constructed or commercially-manufactured gyroplanes that have achieved initial Acceptance and initial Listing will be required to undertake a 40+ hour Flyoff" as detailed in later sections.

15.19 **For 2-seaters, the carriage of a 2nd occupant is normally prohibited during a Flyoff period. This requirement can only be varied in writing (ie, email) by the HOFO for specific safety-related reasons during specified evaluation flights where another pilot-certificate holder may be carried for specified data acquisition or data-gathering purposes.**

No "Flyoff" period required for Listed gyros on-sold to another member

15.20 "Flyoff" periods are only applicable to:

(a) New gyroplanes; or

(b) Gyroplanes that have been repaired or rebuilt from major damage.

5-hour "Shakedown" periods required for new gyroplanes for which previous examples have already been Type Accepted and the First-of-Type Protocols have been completed for a previous example

15.21 If a NEW example of a previously Type-Accepted Gyroplane has been imported or domestically manufactured, then it will not be required to do a 40" "Flyoff." Instead, such gyros are only required to undergo a 5-hour "Shakedown" period, which normally involves the Importer's or Manufacturer's nominated Instructor taking the new purchaser through appropriate training sequences so that the new owner will acquire a passable degree of competency with their new machine.

15.22 History shows that inevitably, during these initial hours it's highly probable that various things will need to be adjusted or sorted out before the purchaser sets off on their own taking the gyro back to their home strip. The 5-hour "Shakedown" is the prime opportunity for the new owner to familiarise themself with the gyro and its performance under the watchful eye of the Importer's or Manufacturer's nominated Instructor.

15.23 **The carriage of a 2nd Non-Instructor occupant is prohibited during the 5-hour "Shakedown".**

Flight Manuals

15.24 A Flight Manual is a statutory requirement for every Australian aircraft. Gyroplanes manufactured by a commercial manufacturer MUST use the Flight Manual supplied by the manufacturer. For homebuilt or hybrid reconstructed gyroplanes, a sample Flight Manual that can be used as the initial basis for developing the Flight Manual for the home-build or rebuild is available for download on the ASRA website.

15.25 ASRA expects that each member will faithfully create and maintain a Flight Manual for their gyroplane, or if the gyroplane has been commercially produced, that the manufacturer's Flight Manual is safeguarded, maintained and updated as necessary.

15.26 Electronic submission of a copy of a Compliant gyroplane's Flight Manual is expected after the F022(b) processes have been completed. The copy will be retained on ASRA's permanent records for that particular gyroplane.

ASRA's Sample Flight Manual

15.27 **A sample Flight Manual is included as Annex A to this TPM at pages 142 to 155.**

15.26 Readers should note that the Microsoft Word version of the ASRA sample Flight Manual can be downloaded from the ASRA website, and that the document is set up so that the performance figures and other information can be typed into the various sections of that document.

Section 16

SINGLE-SEAT BASIC ULTRALIGHT GYROPLANES ACCEPTANCE AND LISTING

ASSESSED AGAINST THE ASRA BASIC GYROPLANE CONSTRUCTION STANDARDS

(Under CASR Part 103 known as 'Basic Ultralight Gyroplanes')

ASRA FORM F024 – 40+ HR FLYOFFS

ASRA's Form F024(a) and (b) used for Acceptance and Listing of Basic Single-Seat Gyroplanes

16.01. New-build or Re-Build single-seat gyroplanes, whether amateur-constructed, assembled from a kit, or bought from a commercial manufacturer, if their empty weight does not exceed 250 kilograms, can be Listed by ASRA as a Basic Ultralight Gyroplane under CASR Part 103.

Steps that the owner-builder needs to undertake before attempting to List a gyro.

16.02. An ASRA member wanting to have a New-Build or Re-Build single-seater gyroplane with an empty weight not exceeding 250 kilograms Accepted and Listed as a Basic Ultralight Gyroplane must do the following steps:

(a) Access and download the ASRA Basic Gyroplane Construction Standards from the ASRA website;

(b) It is recommended that the Standards be printed out and placed into a binder or folder;

(c) The member should then study the Basic Gyroplane Construction Standard very closely, comparing the gyro they have constructed or purchased to the Construction Standards;

(d) The member should then take whatever steps are necessary to bring their new gyroplane up to the specified standards;

(e) Once the member is confident that their new gyroplane conforms to ASRA's Basic Gyroplane Construction Standard, they should then download ASRA's Form F024 from the website and study that document;

(f) The member should note carefully how the F024 is divided into two parts – parts (a) and (b). Part (a) is the section needed to be filled-in to initiate the Acceptance and Listing process;

(g) The member also needs to note carefully that F024(a) cannot be submitted to the ASRA Registrar unless the member has filled the document in completely and accurately, and that an ASRA TA has initialed every grey box on the F024(a), as well as the owner-member swearing the Statutory Declaration at page 6 of the Form, and the Technical Adviser signing the Record of Verification at page 7; and

(h) The documentation can then be scanned and emailed or physically posted to the ASRA Registrar for processing, and the necessary fees also forwarded.

NOTE: History shows that it is unlikely that an F024(a) will be fully signed-off by the owner and the TA on the first go. Inevitably there will be a variety of features that need to be improved or rectified before the TA will initial each and every grey box. This usually means that the owner-member and the TA should be prepared for at least two and probably three or more attempts at successfully completing the pre-Acceptance and Listing inspection.

ASRA Registrar's processing

16.03. Members should expect a turn-around time of up to one week between the time they submit their fully completed and signed F024(a) and pay the fee.

16.04. Members should also anticipate that the Registrar may phone or email them with any queries the Registrar may have.

16.05. Once the gyro has been Accepted and Listed, the Registrar will mail out to the member an adhesive Listing Placard (to be stuck on the rotor mast of the gyro) and a receipt for fee payment.

40-hour Flyoff period for New-build Basic Single-Seater Gyros

16.06. Once a new-build or re-build Basic Single-Seater has been Listed and Listing sticker adhered to the mast, the owner-pilot is then free to start undertaking the 40-hour "flyoff" period (flying their gyro at their own risk). The initial Listing classification will be "Provisional" because the initial Listing will only have been processed using ASRA Form F024 Pages 2 through 7, known as Part (a).

16.07. **40-hour "flyoff" for New-build or Re-Build Basic single-seaters.** ASRA mandates that the first 40 hours of a New-Build or Re-Build Basic gyroplane's operational life is to be undertaken very carefully and cautiously, using incremental steps where the owner-pilot gradually and conservatively explores the performance and handling characteristics of their gyroplane. ASRA strongly suggests that operations be confined to being at or over the home field, or no further afield than within easy retrieval distance in case a precautionary landing needs to be made, and not be made over populous areas. ASRA also strongly suggests that initial flying always be done while other people are around so that assistance can be available if precautionary landings are needed.

16.08. **Working towards establishing the performance figures required for ASRA Form F024 Part (b), (pages 8 to 11).** Once an owner-pilot has sufficient confidence with and understanding of their gyro to begin to record the performance figures of the machine, they should carefully progress to recording the various airspeeds, climb and descent rates, and take off and landing distances.

16.09. Originally, it was intended that the information for inclusion in the F024 Part (b) would be gathered within the first 25 hours, but history and widespread experience shows that it often takes many additional tens of hours more before a gyro is properly "sorted out." Accordingly, a gyro can be kept as "Provisional" for as long as needed to properly sort out the machine performance-wise.

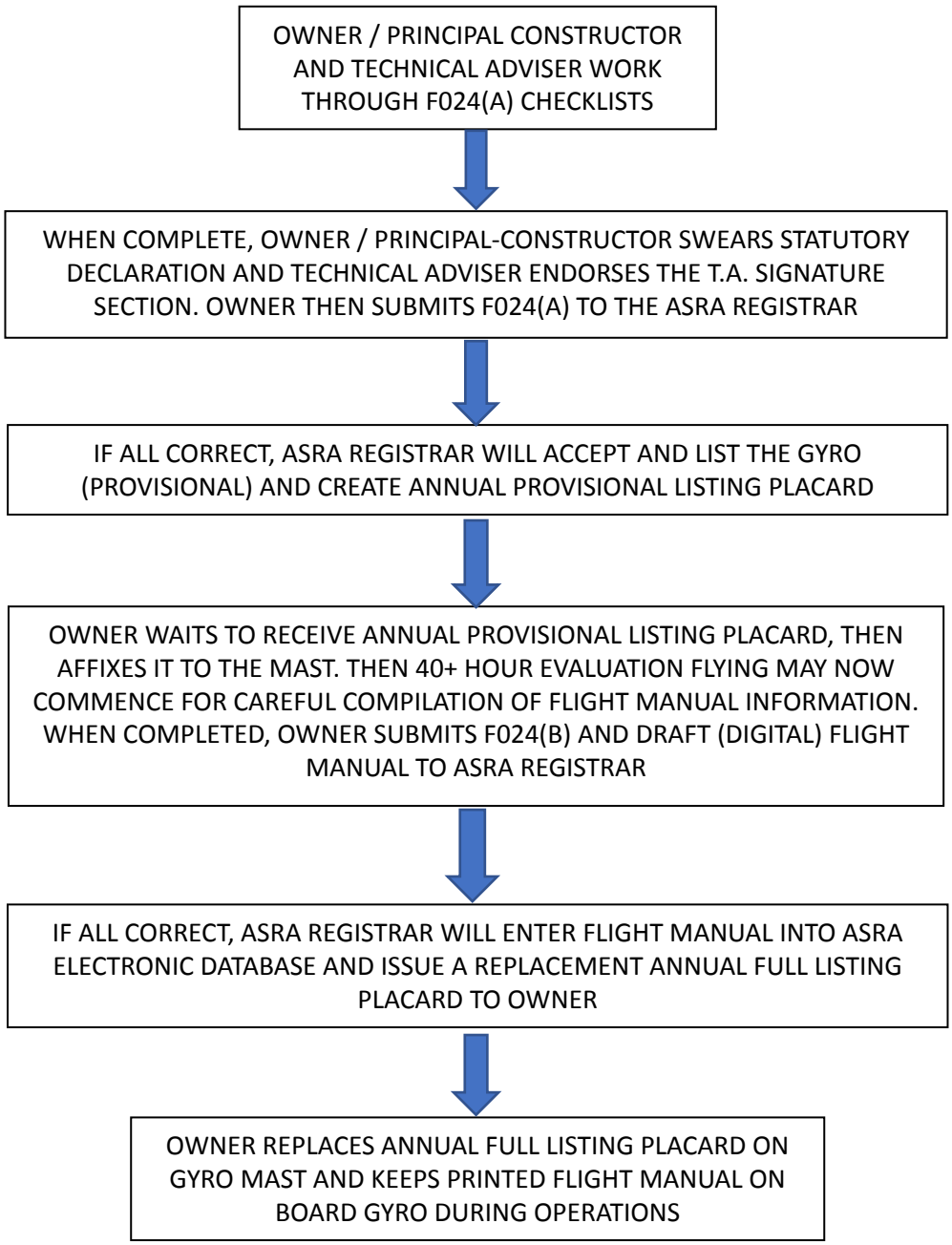
16.10. It must also be carefully noted that the performance figures of the gyro for inclusion in the F024 Part (b) must be established at or very close to ISA standard temperatures and pressures of 60 deg Fahrenheit (15 deg C) and 1013 Mb at or near sea level.

Submitting the F024 Part (b) after the flyoff testing performance figures are known.

16.11. Once the owner-member has acquired all the necessary performance information for their gyro, the member is to fill out the Part (b) and have their TA also initial the relevant grey boxes on the Form. The owner-member is to complete the second Statutory Declaration (at F024 page 10) and the TA is to sign the Record of Verification (at F024 page 11). The Form 024(b) is then sent to the Registrar.

Listing sequence table on next page.

NEW-BUILD or RE-BUILD BASIC SINGLE-SEAT GYROS ACCEPTANCE AND LISTING SEQUENCE SUMMARY



THE FOLLOWING 11 PAGES ARE THE ASRA FORM F024

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INCORPORATED

F024 Acceptance & Listing Protocols – **NEW** Basic Ultralight Gyroplanes OR **Lapsed-Listing Rebuilt** Basic Ultralight Gyroplanes OR **Major Damage Rebuilt** Basic Ultralight Gyroplanes Record of Inspection and Evaluation Processes Statutory Declarations of Conformity with Standards

ABN 53 412 417 012

This document can either be filled out progressively as inspection and evaluation steps are completed or may be filled in at the completion of the said inspection and evaluation by transferring data from contemporaneous records. Inspection and evaluation will need to be done in two parts. Form F024 part (a) must be completed and signed off before a Limited Flight Status Listing (Provisional) can be issued. This limited flight status is to allow the specified flight evaluation to be completed before a Full Flight Status Listing (Basic) can be issued. The flight evaluation is recorded in Form F024 part (b)

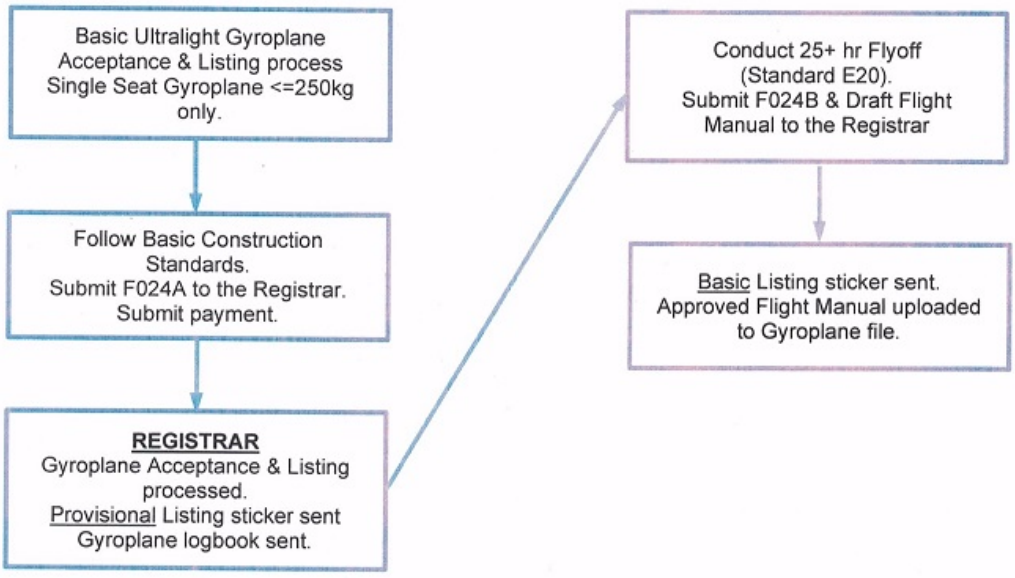
The person whose initials and signature are affixed to this document is to be that of the person who is the **Principal Constructor or a Factory Authorised Representative**. If flight evaluation is undertaken by a person who is not the principal constructor, the principal constructor MUST satisfy themselves of the integrity and accuracy of the performance-related information entered into this document. Where in-flight performance figures are concerned, the principal constructor shall ensure the accuracy of the figures either by contemporaneously and accurately recording instrument readings radioed to him or her by the pilot undertaking the relevant sequence or by the recording of instrument readings by electronic means such as readouts, traces or even a simple video camera recording of the relevant instrument or instruments. The principal constructor is also personally responsible for the accuracy and integrity of all external observations (such as take-off distance to 50' AGL, or landing distance from 50' AGL).

Form F024 is to be used in conjunction with the ASRA Construction Standards for Basic Gyroplanes.

This form provides a means of recording that each inspection and evaluation process has been satisfactorily completed. A space is provided after each item for the evaluator's initials.

The **Principal Constructor or a Factory Authorised Representative** is the **ONLY** person entitled to initial the **'PC Initials'** boxes. Several sections have **'TA Initials'** boxes to the right of the principal constructor initials boxes. These 2nd boxes are **ONLY** to be used by ASRA Technical Advisers who are checking the integrity of the Principal Constructor's assertion made in that relevant sub-section. For the purposes of this document, the Principal Constructor and the countersigning Technical Adviser cannot be the same person.

The flow chart below represents the steps to follow to obtain final Basic Acceptance and Listing..



Form F024 part (a) Construction, Inspection, and Evaluation before in-flight phase

Principal Constructor: .....

Some appendices are provided giving conversion information.

Gyroplane Listing No.	**G**	Airframe Serial No.	

	Initials PC	TA
Subpart B		
Weight and Balance		
B10. Hang Test ..... ° nose down		- - - -
Details of Hang Test entered into the Flight Manual		
B15. Maximum Selected Weight ..... kg.		- - - -
Maximum Weight entered into the Flight Manual		
B20. Empty Weight. ..... kg		- - - -
Empty Weight and conditions of test entered into the Flight Manual		
B30. Tilt Back Test Distance in cm between the propeller thrust line and the vertical centre of gravity		- - - -
Single seater Full tank ..... cm Empty tank ..... cm		- - - -
Printed/digital photos to be submitted with section (a)		
Subpart C		
Structure		
C15. Strength and Deformation requirements have been met		- - - -
FLIGHT LOADS		
C30. Limit Manoeuvring Load requirements have been met		- - - -
CONTROL SURFACE AND SYSTEM LOADS		
C55. Primary Control System requirements have been met		- - - -
C60. The controls meet the Limit Pilot Force requirement		- - - -
STABILISING AND CONTROL SURFACES		
C75. Control Surfaces meet the required limit loads		- - - -
GROUND LOADS		
C85. The energy absorption requirements for of the Landing Gear have been met.		
Note the TA must witness the drop test.		
MAIN COMPONENT REQUIREMENTS		
C90. Rotor Structure requirements have been met		- - - -
EMERGENCY LANDING CONDITIONS		
C100. The structural requirements for emergency landing situations have been met		- - - -
C102. The Fatigue Strength requirements have been met		- - - -
C104. The Special Factors of Safety requirements have been met		- - - -

Subpart D	Initials	
Design and Construction	PC	TA
D10. The requirements for Materials have been met		----
D20. The requirements for Locking of Connections have been met		
D30. Provision for Inspection is satisfactory		
D70. Cable factor requirements met by		----
CONTROL SURFACES AND ROTORS		
D80. The Rotor Drainage requirements have been met		
D85. The requirements for Control Surfaces and rotors has been met		
D90. The requirements for rudder hinges have been met		----
D95. The requirements of Mass Balance have been met		----
D100 (b). Rotor Hub Tilt Range Fore/Aft ..... deg Side/Side ..... deg		
D100 (c). Hub Bar Teeter Range ..... degrees		
D102 Rotor Clearance ..... mm Clear of Prop ..... mm Clear of Tail		
D105. Rotor Head Bearings are satisfactory This has been determined by:		

D107.The Rotor Disc Loading is ..... lbs/ft² The Rotor Disc Diameter is ..... ft.		----
CONTROL SYSTEMS		
D110. Controls movement satisfactory		
D115. Controls stops are satisfactory		
D125. Trim System is satisfactory		
D135. Control System is satisfactory		
D145. Cable Systems are satisfactory		
D147. The suitability of Swivel Rod Ends has been determined by:		

COCKPIT DESIGN		
D155. The General requirements for Cockpit Design have been met		
D160. The Cockpit View is satisfactory		
D165. The Windshields and Windows are satisfactory		
D170. The location of the Cockpit Controls is satisfactory		
D185. The requirements for the Seat and Safety Harness have been met		
D190. The Protection from Injury requirements have been met		
D200. The Emergency Exit requirements have been met		
D205. The Ventilation requirements have been met		
Subpart E		
Powerplant - GENERAL		
E5. Powerplant Installation is satisfactory		
E15 The design of the rotor spin up and brake system is satisfactory		
Limitations on the use of the spin up or brake system have been entered into the Flight Manual		
E25. The Propeller Clearance is satisfactory		

	Initials PC	TA
FUEL SYSTEM		
E30. General – The Fuel System installation is satisfactory		
E35. The Fuel Flow requirements have been met		----
E40. The quantity of Unusable Fuel has been determined and marked on the fuel gauge		
The unusable fuel quantity has been entered into the Flight Manual		
E45. The Fuel Tank(s) Integrity and surge characteristics are satisfactory		----
E55. The installation of the Fuel Tank(s) is satisfactory		
E60 (a). The Fuel Tank(s) is/are equipped with drainable sump(s) ☐ or Sediment bowl(s) ☐		
E60 (b). The sump or sediment bowl drain can be locked in the closed position		
E65. The requirements for the Fuel Tank Filler have been met		
E70. The requirements for Fuel Tank Vents have been met		
E75. The requirements for a Fuel Strainer or Filter have been met		
E80. The requirements for the Fuel System Lines and Fittings have been met		
OIL SYSTEM		
E90. The general requirements have been met		----
E95. The requirements for Oil Tanks has been met		
E105. The requirements for the Oil Lines and Fittings have been met		
COOLING		
E110. The requirements for Powerplant Cooling have been met		----
EXHAUST SYSTEM		
E120. The requirements for the exhaust and silencing system have been met		
POWERPLANT CONTROLS AND ACCESSORIES		
E135. The requirements for the Ignition Switches have been met		
E140. The requirements for Propeller Speed have been met		----
E145. The design of the Cowling and Nacelle is satisfactory		----
Subpart F – Equipment		
INSTRUMENTS		
F10. The required Flight and Navigation Instruments are satisfactory		
F15. The required Powerplant Instruments are satisfactory		
INSTRUMENTS INSTALLATION		
F30. The requirements for the Pitot and Static Pressure Systems have been met.		
ELECTRICAL SYSTEMS AND EQUIPMENT		
F45. The requirements for Electric Cables and Equipment have been met		
MISCELLANEOUS EQUIPMENT		
F55. The requirements for the Airborne Radio and Radio Navigation Equipment have been met		
Subpart G - Operating Limitations and Information		
G20. The requirements for Powerplant and Propeller Limitations have been met		----
Markings and Placards		
G30. The requirements for Placards and/or Markings have been met		
G45. The requirements for the Fuel Quantity Indicator have been met		
G50. The Control Markings have been met		

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INC

GYROPLANE ACCEPTANCE & LISTING FORM

CASA Regulations state that only current financial ASRA members
And Registrant are permitted to fly and register a Gyro

ABN 53 412 417 012

ASRA Membership No: A	Gyroplane Listing No: G	Airframe Serial No:

Registrant Given Names: _____ **Registrant Family Name:** _____

Address: _____ **Phone No:** _____

Town: _____ **State:** _____ **P/Code:** _____

Email: _____

Cockpit: ☐ Open Frame ☐ Semi Enclosed ☐ Fully Enclosed — Empty weight including rotors: _____ kg

Places: ☐ One ☐ Two Side by Side ☐ Two Tandem — MTOW: _____ kg

Aircraft Status: ☐ Registered ☐ Unregistered ☐ Destroyed — Gyroplane Primary Colour: _____

Hang Test: 1 UP _____ Degrees ☐ Nose up
Hang Test: 2 UP _____ Degrees ☐ Nose down
Controls Fore/Aft Angle: _____ Controls Side/Side Angle: _____ Total Teeter Angle: _____

Gyroplane Manufacturer: _____ Model: _____ Model No: _____

Main Frame Material: _____ Size: _____ mm Mast Material: _____ Size: _____ mm

Frame Plates Material: _____ Thickness: _____ mm

Vertical Tail Type & Area: ☐ Rudder & Fin ☐ Full Flying ☐ Twin Tail ☐ Tri Tail
Total Vertical Tail Area: _____ m^2 Horizontal Distance from C of G: _____ m

Pitch Stabiliser Location & Area: ☐ In propeller slipstream ☐ Outside propeller slipstream
Stabiliser Area: _____ m^2 Horizontal Distance from C of G _____ m

Rotor Head Manufacturer: _____ Serial No: _____

Rotor Blade Manufacturer: _____ Rotor Blade Model: _____ Length: _____ ft

Hub Bar Serial No: _____ Rotor Blade Serial Nos: Blade 1 _____ Blade 2 _____

Propeller Manufacturer _____ Serial No: _____ Diameter: _____ in

Engine Manufacturer _____ Type: _____ Engine No: _____ Engine Capacity: _____ cc

Redrive Make: _____ Serial No: _____ Ratio: _____ : 1

Fuel Tank Manufacturer _____ Capacity: _____ LTS

Mandatory Instruments	☐ ASI	☐ Altimeter	☐ Fuel Indicator	☐ Yaw Indicator
Gyroplane Instruments	☐ Hour Meter	☐ Oil Pressure (4 strokes)	☐ Engine tacho	
	☐ Compass	☐ Volts (Battery Ignition)	☐ Temperature	
Significant Extras	☐ GPS	☐ Transponder	☐ ELT	☐ VHF ☐ UHF

☐ **Mandatory photos from the side**

NOTE: Upon completion of the inspection above, complete the Statutory Declaration below, have the Technical Adviser complete the statement below, then forward (post or email) these together with the appropriate fee and photos to the ASRA Registrar at registrar@asra.org.au or to the address found on the www.asra.org.au website.

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INC

Statutory Declarations Act 1959 (Commonwealth).

COMMONWEALTH OF AUSTRALIA

Statutory Declaration

I, ... (insert printed full name of Principal Constructor) ..... (insert occupation)

of ..... (insert residential address of Principal Constructor)

do solemnly and sincerely declare that:

(1) in placing my initials in the check box adjacent to each sub-section and now upon finally signing this my declaration, I hereby attest that the materials, construction techniques, fittings, structural configuration, and overall design of the gyroplane I seek to register as a Limited Flight Status gyroplane, for the flight tests specified in the ASRA document, Construction Requirements for Compliant Gyroplanes, has been carefully reviewed by me for compliance with the published standards.

(2) the information contained in the narrative or comment portions of this record of testing and inspection has been acquired personally by me or under my supervision and I hereby attest that I have taken all reasonable steps to ensure its accuracy and reliability;

and I make this solemn declaration by virtue of the Statutory Declarations Act 1959, and subject to the penalties provided by that Act for the making of false statements in statutory declarations, conscientiously believing the statements contained in this declaration to be true in every particular

..... (Signature of Principal Constructor) ..... (Initials of Principal Constructor)

Declared at ..... (Place) on the ..... (Date) day of ..... (Month/Year)

Before me, ... (signature of person witnessing declaration)

..... (Print full name of witness)

..... (Professional address)

..... (category of entitlement to witness declarations. See next page)

The Statutory Declarations Regulations provide for a statutory declaration under the *Statutory Declarations Act 1959* to be made before the following persons:

(1) a person who is authorised under a law in force in a State or Territory to practise as a member of any of the following professions:

- Chiropractor
- Dentist
- Legal practitioner
- Medical practitioner
- Nurse
- Patent attorney
- Pharmacist
- Veterinary surgeon

(2) any of the following persons:

- Agent of the Australian Postal Corporation who is in charge of an office supplying postal services to the public
- Australian Consular Officer, or Australian Diplomatic Officer, (within the meaning of the *Consular Fees Act 1985*)
- Bailiff
- Bank officer with 5 or more continuous years of service
- Building society officer with 5 or more years of continuous service
- Chief executive officer of a Commonwealth court
- Civil marriage celebrant
- Clerk of a court
- Commissioner for Affidavits
- Commissioner for Declarations
- Credit union officer with 5 or more years of continuous service
- Holder of a statutory office not otherwise specified in this list
- Judge of a court
- Justice of the Peace
- Magistrate
- Master of a court
- Member of the Australian Defence Force who is:
  (a) an officer; or
  (b) a non-commissioned officer within the meaning of the *Defence Force Discipline Act 1982* with 5 or more years of continuous service; or
  (c) warrant officer within the meaning of that Act
- Member of the Institute of Chartered Accountants in Australia, the Australian Society of Certified Practicing Accountants or the National Institute of Accountants
- Member of the Institute of Corporate Managers, Secretaries and Administrators
- Member of the Institution of Engineers, Australia, other than at the grade of student
- Member of:
  (a) the Parliament of the Commonwealth; or
  (b) the Parliament of a State; or
  (c) a Territory legislature; or
  (d) local government authority of a State or Territory
- Minister of religion registered under Division 1 of Part IV of the *Marriage Act 1961*
- Notary public
- • Permanent employee of:
  (a) the Commonwealth or of a Commonwealth authority; or
  (b) a State or Territory or of a State or Territory authority; or
  (c) a local government authority; with 5 or more years of continuous service who is not otherwise specified in this list
- Permanent employee of the Australian Postal Corporation with 5 or more years of continuous service who is employed in an office supplying postal services to the public
- Person before whom a statutory declaration may be made under the law of the State or Territory in which the declaration is made
- Police officer
- Registrar, or Deputy Registrar, of a court
- Senior Executive Service officer of the Commonwealth, or of a State or Territory, or of a Commonwealth, State or Territory authority
- Sheriff
- Sheriff's officer
- Teacher employed on a full-time basis at a school or tertiary education institution

ASRA TECHNICAL ADVISERS RECORD OF VERIFICATION
F024 part (a)

I hereby certify that I have undertaken an examination of the gyroplane subject of this Record and have inserted my initials in the relevant check boxes (where applicable) as an indication that (as far as can be ascertained by visual and/or manual examination) the entry made by the Principal Constructor in the sub-section adjacent to the check box appears to be true and correct.

....
(Signature of TA) (Initials of TA)

..... A.....
(Print Name of TA) (ASRA Membership No)

.....
(Date)

***** Gyroplane will be registered as Provisional until the mandatory flight endurance, draft flight manual and the F024B have been submitted.**

Form F024 part (b) Flight and Performance Evaluation

Note: part (a) of this form must be completed and the gyroplane Accepted and Listed for limited flight status before commencing flight and performance evaluation.

Principal Constructor: ..... Listing No. G.....

Evaluation Pilot:..... ASRA Membership No. A.....

PERFORMANCE	Initials PC	Initials TA
B40. Take-off Distance Without Prerotator .....m. With Prerotator .....m.		- - - -
The Take-off Distance entered into the Flight Manual		
B45. Climb Rate Time taken to 1000 ft .....min.		- - - -
The corrected sea level Climb Rate entered into the Flight Manual		
B50. Minimum Sink Rate .....KIAS Rate of descent .....ft/Min		- - - -
Minimum Sink Rate @KIAS = ft/min entered into the Flight Manual		
B52. Best Glide Ratio .....KIAS Rate of descent .....ft/Min		- - - -
Best Glide Ratio @KIAS = X.X:1 entered into the Flight Manual		
B55. Actual straight-and-level steady top airspeed at 1000' agl at full throttle established as .. .. KIAS		- - - -
Actual straight-and-level full-throttle steady top IAS entered into the Flight Manual		
B60. Minimum Controllable Speed for Level Flight (VMIN) determined as .....KIAS		- - - -
The (VMIN) entered into the Flight Manual		
B65. Best Rate of Climb Airspeed (VY) determined as .....KIAS		- - - -
The details of (VY) entered into the Flight Manual		
B70. Landing Distance from 50 ft altitude .....m at .....KIAS		- - - -
The Landing Distance entered into the Flight Manual		
B75. Maximum Operating Altitude established as .....Feet		- - - -
The Maximum Operating Altitude entered into the Flight Manual		
B80. Height/Velocity Envelope established as .....ft at .....KIAS		- - - -
Height/Velocity Envelope Graph entered into the Flight Manual		

CONTROLLABILITY AND MANOEUVRABILITY		
B85 (a) & (b). Controllability and Manoeuvrability is satisfactory		- - - -
B90. Pitch Control is satisfactory		- - - -
B95. Pitch Control Force is satisfactory		- - - -
STABILITY		
B100. General gyroplane stability is satisfactory		- - - -
B105. Longitudinal Stability is satisfactory		- - - -
B110. Lateral Stability is satisfactory		- - - -

	Initials	
GROUND HANDLING	PC	TA
B120. Directional Control is satisfactory		- - - -
B125. Taxying is satisfactory		- - - -
B127. Ground Resonance is satisfactory		- - - -
GENERAL		
E20. Flight Endurance test completed satisfactorily		- - - -
OPERATING LIMITATIONS AND INFORMATION		
G10. The requirements for Air-speed Limitations have been met		- - - -
G25. The Gyroplane Flight Manual has been produced and a hardcopy and electronic copy (*.doc) have been supplied to the ASRA Registrar.		

NOTE: Upon satisfactory completion of parts (a) and (b) of this form, complete the Statutory Declaration below, have the Technical Adviser complete the statement below, then forward (post or email) these together with the appropriate fee and photos to the ASRA Registrar at registrar@asra.org.au or the address found on the www.asra.org.au website.

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INC

Statutory Declarations Act 1959 (Commonwealth).

COMMONWEALTH OF AUSTRALIA

Statutory Declaration

I, ... (insert printed full name of Principal Constructor) (insert occupation)

of ..... (insert residential address of Principal Constructor)

do solemnly and sincerely declare that:

(1) in placing my initials in the check box adjacent to each sub-section and now upon finally signing this my declaration I hereby attest that the materials, construction techniques, fittings, structural configuration, and overall design and performance of the gyroplane I seek to register as a Limited Flight Status gyroplane, for the flight tests specified in the ASRA document Construction Requirements for Compliant Gyroplanes, has been carefully reviewed by me for compliance with the published standards.

(2) the information contained in the narrative or comment portions of this record of inspection and evaluation has been acquired personally by me or under my supervision and I hereby attest that I have taken all reasonable steps to ensure its accuracy and reliability;

and I make this solemn declaration by virtue of the Statutory Declarations Act 1959, and subject to the penalties provided by that Act for the making of false statements in statutory declarations, conscientiously believing the statements contained in this declaration to be true in every particular.

.... (Signature of Principal Constructor) (Initials of Principal Constructor)

Declared at ..... (Place) on the ..... (Date) day of ..... (Month/Year)

Before me, ... (signature of person witnessing declaration)

..... (Print full name of witness)

..... (Professional address)

..... (category of entitlement to witness declarations. See next page)

The Statutory Declarations Regulations provide for a statutory declaration under the *Statutory Declarations Act 1959* to be made before the following persons:

(1) a person who is authorised under a law in force in a State or Territory to practise as a member of any of the following professions:

- Chiropractor
- Dentist
- Legal practitioner
- Medical practitioner
- Nurse
- Patent attorney
- Pharmacist
- Veterinary surgeon

(2) any of the following persons:

- Agent of the Australian Postal Corporation who is in charge of an office supplying postal services to the public
- Australian Consular Officer, or Australian Diplomatic Officer, (within the meaning of the *Consular Fees Act 1985*)
- Bailiff
- Bank officer with 5 or more continuous years of service
- Building society officer with 5 or more years of continuous service
- Chief executive officer of a Commonwealth court
- Civil marriage celebrant
- Clerk of a court
- Commissioner for Affidavits
- Commissioner for Declarations
- Credit union officer with 5 or more years of continuous service
- Holder of a statutory office not otherwise specified in this list
- Judge of a court
- Justice of the Peace
- Magistrate
- Master of a court
- Member of the Australian Defence Force who is:
  (a) an officer; or
  (b) a non-commissioned officer within the meaning of the *Defence Force Discipline Act 1982* with 5 or more years of continuous service; or
  (c) warrant officer within the meaning of that Act
- Member of the Institute of Chartered Accountants in Australia, the Australian Society of Certified Practicing Accountants or the National Institute of Accountants
- Member of the Institute of Corporate Managers, Secretaries and Administrators
- Member of the Institution of Engineers, Australia, other than at the grade of student
- Member of:
  (a) the Parliament of the Commonwealth; or
  (b) the Parliament of a State; or
  (c) a Territory legislature; or
  (d) local government authority of a State or Territory
- Minister of religion registered under Division 1 of Part IV of the *Marriage Act 1961*
- Notary public
- • Permanent employee of:
  (a) the Commonwealth or of a Commonwealth authority; or
  (b) a State or Territory or of a State or Territory authority; or
  (c) a local government authority; with 5 or more years of continuous service who is not otherwise specified in this list
- Permanent employee of the Australian Postal Corporation with 5 or more years of continuous service who is employed in an office supplying postal services to the public
- Person before whom a statutory declaration may be made under the law of the State or Territory in which the declaration is made
- Police officer
- Registrar, or Deputy Registrar, of a court
- Senior Executive Service officer of the Commonwealth, or of a State or Territory, or of a Commonwealth, State or Territory authority
- Sheriff
- Sheriff's officer
- Teacher employed on a full-time basis at a school or tertiary education institution

ASRA TECHNICAL ADVISER'S RECORD OF VERIFICATION
F024 part (b)

I hereby certify that I have undertaken an examination of the gyroplane subject of this Record and have inserted my initials in the relevant check boxes (where applicable) as an indication that (as far as can be ascertained by visual and/or manual examination) the entry made by the Principal Constructor in the sub-section adjacent to the check box appears to be true and correct.

....
(Signature of TA) (Initials of TA)

..... A.....
(Print Name of TA) (ASRA Membership No)

.....
(Date)

Section 17

SINGLE-SEAT BASIC ULTRALIGHT GYROPLANES

TRANSFERS OF OWNERSHIP BETWEEN ASRA MEMBERS

(Gyroplane becomes classified as second-hand)

MAIN POINTS –

(A) Once the new owner has actual custody and possession of the gyro the new owner is to contact a T.A. to inspect the gyro;

(B) If the body weight of the previous owner / person who flew the gyro is not known, then a photographed hang test with the new owner must form part of the T.A. Inspection. If the hang-angle is out of specification, new cheek plates will need to be fabricated. If the body-weight of seller and purchaser is within 20kg, a hang test is not compulsory but is still highly recommended;

(C) The Listing of the gyroplane MUST be promptly transferred into the new owner's name once it is in their custody and possession – failure to do this could easily jeopardise ASRA's insurance cover in case of accident.

Second-hand

17.01. Most ultralight gyroplanes transacted or acquired in Australia are usually second-hand.

17.02. For technical administration purposes, the fact that a gyroplane has been acquired second-hand gives rise to several fairly obvious points:

(a) it can't be assumed that any "downstream" purchaser will have anywhere the in-depth knowledge of the gyroplane that the first owner had, ESPECIALLY if that first owner was the amateur-constructor or builder;

(b) therefore, it can't be assumed that the downstream purchaser will have technical skills and competencies matching that of the original constructor; and

(c) this fact may have implications in the maintenance, modification and repair authorisations that a person might be granted. At time of writing the CASR Part 103 Manual of Standards (MOS) has not yet been released by CASA, so it is not currently known what restrictions, if any, might be placed on the buyers of 2nd hand aircraft.

17.03. When the ownership of an ASRA Gyroplane is transferred, ASRA uses this transaction as an opportunity for a Technical Adviser to undertake a 3'd-party inspection of the gyroplane to ensure that the gyroplane continues to comply with the Gyroplane Construction Standards, whether Basic or Compliant.

17.04. This process is broadly like the "roadworthy" inspection process for car that most States in Australia require for changes of ownership. A kev difference, however, is that the responsibility for arranging the Technical Adviser inspection rests on the buyer - **NOT the seller**.

17.05. The reason for this is that long experience has shown that sellers generally aren't particularly interested in the machine they are selling, whereas the buyers are normally keenly interested and enthusiastic in every aspect of their new acquisition. Accordingly, ASRA's policy

is that the new owner should collaborate closely with a Technical Adviser to familiarise themself with every nut and bolt of their acquisition. The Technical Adviser inspection is the golden opportunity for this new-owner familiarisation to occur.

17.06. The post-purchase Technical Adviser inspection is also the perfect opportunity for the new owner and the Technical Adviser to discuss any possible adjustments, refinements, or changes the new owner might be contemplating.

Hang-Testing may be required

17.07. ASRA requires a Hang-Test to be undertaken if there is more than a **20 kilogram** weight difference between the seller and the buyer. This is needed to determine whether a revised set of rotor head cheek plates might need to be fabricated, because if a lightweight pilot sells a Basic Ultralight gyro to a heavyweight buyer, then chances are that the gyroplane is likely to fly too nose-low, and the situation might arise where the heavyweight pilot may be flying around holding the stick almost in his guts, and where he may not be able to pull the stick back any further to adequately flare.

17.08. The converse also applies - if a heavyweight pilot sells a Basic Ultralight Gyroplane to a lightweight buyer, there is a risk the light-weight buyer may need to fly around with the stick held way too far forward, leading to rapid fatigue and discomfort.

17.09. These are the reasons why ASRA requires a hang test if there is more than a **20 kilogram** weight variance between seller and buyer.

17.10. If a buyer is buying a gyro from a personal representative of another ASRA member who might be overseas or who has recently passed away, then ASRA requires a hang-test to be done in every situation of this kind.

Transfers of Ownership - where the Seller and Buyer are current ASRA members transferring a Listed Basic Single-Seat Ultralight Gyroplane

17.11. The following sequence is to be observed:

ASRA member transferring ownership to another ASRA member must provide to the buyer -

(1) ASRA Form F006 signed by seller hander to the buyer;

(2) Gyro Flight Manual hard copy handed by seller to the buyer; and

↓

Buyer then arranges for a Technical Adviser to undertake a post-purchase inspection of the gyro.

↓

If there is more than **20 kilograms weight** variation between the selling pilot and the acquiring pilot, a Hang-Test witnessed by the Technical Adviser is to be done.

↓

Buyer sends completed Form F006 to ASRA Registrar after Technical Adviser has inspected the gyroplane, witnessed the Hang-Test (if required), and signed-off the TA section on F006

ASRA's Form F006 - Gyroplane ownership transfer or sign-off after Major Modifications or Repairs

17.12. **A copy of ASRA Form F006 is set out on the following two pages**.

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INC

F006 GYROPLANE OWNERSHIP TRANSFER or sign-off after MAJOR MODIFICATIONS or REPAIRS

CASA Regulations state that only current financial ASRA members and Registrant are permitted to fly and register a Gyro

ABN 53 412 417 012

ASRA Membership No:	A	**Gyroplane Listing No:**	G	**Airframe Serial No:**	

Registrant Given Names: _____ **Registrant Family Name:** _____

Address: _____ **Phone No:** _____

Town: _____ **State:** _____ **P/Code:** _____

Email: _____

☐ **(A)** New Listing (Compliant Gyros only) or Renewal of Listing (only for expired registered gyros)

☐ **(B)** Transfer of ownership — The seller must advise ASRA of a change of ownership and enter the buyer details below. The Listing is suspended until the buyer submits the transfer fee and a TA inspection is signed or completed online.
***** The seller has provided the buyer with all documents and manuals pertaining to the gyroplane. *****

ASRA No: A _____ Buyer Name: _____ Phone No: _____

Address: _____ State: _____ P/Code: _____

☐ **(C)** Post-Component-Failure Inspection Notification ☐ **(D)** Post-Damage-Major Repair Inspection Notification

☐ **(E)** Notification of recent Major Modifications ☐ **(F)** Post-Grounding Order-Inspection ☐ **(G)** Other (add detailed comments and amend gyro details)

Cockpit: ☐ Open Frame ☐ Semi Enclosed ☐ Fully Enclosed — Empty weight including rotors: _____ kg

Places: ☐ One ☐ Two Side by Side ☐ Two Tandem — MTOW: _____ kg

Aircraft Status: ☐ Registered ☐ Unregistered ☐ Destroyed — Gyroplane Primary Colour: _____

Hang Test: 1 UP _____ Degrees ☐ Nose up
Hang Test: 2 UP _____ Degrees ☐ Nose down
Controls Fore/Aft Angle: _____ Controls Side/Side Angle: _____ Total Teeter Angle: _____

Gyroplane Manufacturer: _____ Model: _____ Model No: _____

Main Frame Material: _____ Size: _____ mm Mast Material: _____ Size: _____ mm

Frame Plates Material: _____ Thickness: _____ mm

Vertical Tail Type & Area: ☐ Rudder & Fin ☐ Full Flying ☐ Twin Tail ☐ Tri Tail
Total Vertical Tail Area: _____ m^2 Horizontal Distance from C of G: _____ m

Pitch Stabiliser Location & Area: ☐ In propeller slipstream ☐ Outside propeller slipstream
Stabiliser Area: _____ m^2 Horizontal Distance from C of G _____ m

Rotor Head Manufacturer: _____ Serial No: _____

Rotor Blade Manufacturer: _____ Rotor Blade Model: _____ Length: _____ ft

Hub Bar Serial No: _____ Rotor Blade Serial Nos: Blade 1 _____ Blade 2 _____

Propeller Manufacturer _____ Serial No: _____ Diameter: _____ in

Engine Manufacturer _____ Type: _____ Engine No: _____ Engine Capacity: _____ cc

Redrive Make: _____ Serial No: _____ Ratio: _____ : 1

Fuel Tank Manufacturer _____ Capacity: _____ LTS

Mandatory Instruments	☐ ASI	☐ Altimeter	☐ Fuel Indicator	☐ Yaw Indicator
Compliant Gyroplanes Mandatory Instruments	☐ Hour Meter	☐ Oil Pressure (4 stroke)	☐ Engine tacho	
	☐ Compass	☐ Volts (Battery Ignition)	☐ Temperature	
Significant Extras	☐ GPS	☐ Transponder	☐ ELT	☐ VHF ☐ UHF

TO BE COMPLETED BY AN ASRA TECHNICAL ADVISER FOR ALL NOTIFICATIONS (A to F) inclusive.

I declare that I have inspected the above Gyroplane and checked that all the control movements are normal as specified in the applicable ASRA Inc. F022 or F024 registration protocols. The Gyroplane complies with all the compliance requirements and the Safety Directives issued by ASRA. Safety Directives can be accessed at https://www.asra.org.au/directives-and-alerts/ I take no responsibility for any modifications carried out after this date unless approved by me. I do not take any responsibility for the accuracy of the owner or manufacturer's statements, or the manner in which the Pilot operates the Gyro. This is an Application for Registration or Renewal and is not indicative of the flight readiness or performance of this aircraft

The Gyroplane qualifies for Listing under the following category:	☐ **Single Seat** ☐ **Provisional** ☐ **Basic** ☐ **Compliant**	☐ **Two Seat** ☐ **Provisional** ☐ **Compliant**
	Airframe Hours: **HRS**	**Engine Hours:** **HRS**

***If Compliant* - Manufacturers Type**
ASRA Approval No: _____

Technical Adviser's Name: _____ Membership No: A _____

Signature: _____ Date: _____

Description of failure/damage/defect and general comments:

Registrant's Signature: **Date:** ☐ **Mandatory photos from the side and of any modified/repaired section of the gyroplane**

*** Registration will not be issued without a current photo***

Schedule of Fees

(Tick appropriate box) DO NOT SEND CASH

Acceptance and Listing 2022 (Registration expires 31st Dec 2022)	☐ **$31 (A)** includes Gyroplane maintenance logbook. TA inspection required
Transfer – Purchaser (Must be an ASRA member)	☐ **$31 (B)** TA inspection required

On receipt of your registration form an invoice will be sent to your email address.
Payment can be made online by credit card and EFT.

Alternatively, payments by cheque or Money Order are made payable to ASRA Inc.
Post Listing Form and cheque to: ASRA Registrar, PO Box 3070 Mandurah East WA 6210.
All documentation can be downloaded from the ASRA Website Members Zone https://www.asra.org.au/member-zone/

Contact the registrar@asra.org.au or 0407 929 479 if you have lost your log on details or do not have internet access.

Section 18

NEW AMATEUR-CONSTRUCTED TWO-SEAT GYROPLANE OR SINGLE-SEATER GYROPLANES ASSESSED UNDER THE ASRA COMPLIANT GYROPLANE CONSTRUCTION STANDARDS

ACCEPTANCE AND LISTING

(Under CASR Part 103 known as 'Ultralight Gyroplanes')

40+-hour Flyoff period for New-Amateur-Constructed Compliant Two-seat or heavier (>250 kg) Single-Seater Gyros

18.01 **New-amateur-build Compliant Two-seat or heavier (>250 kg empty weight) Single-seaters** Once a new-amateur-build Compliant Two-seater or Single-seater has been Listed and Listing sticker adhered to the mast, the owner-pilot is then free to start flying their gyro (at their own risk).

18.02 The initial Listing classification will be "Provisional" because the initial Listing will only have been processed using ASRA Form F022 Pages 2 through 7, known as Part (a).

18.03 ASRA mandates that the first 40+ hours of a new-amateur-build Compliant two-seat or single-seat gyroplane's operational life is to be undertaken very carefully and cautiously, using incremental steps where the owner-pilot gradually and conservatively explores the performance and handling characteristics of their gyroplane. ASRA strongly suggests that operations be confined to being over the home field, not over any populous area, and no further afield than within easy retrieval distance in case a precautionary landing needs to be made. ASRA also strongly suggests that initial flying always be done while other people are around, so that assistance can be available if precautionary landings are needed.

18.04 **For 2-seaters, the carriage of a 2nd occupant is normally prohibited during a Flyoff period. This requirement can only be varied in writing (ie, email) by the HOFO for specific safety-related reasons during specified evaluation flights where another pilot-certificate holder may be carried for specified data acquisition or data-gathering purposes.**

> **NOTE: If, during the 40+ hour Flyoff period, a malfunction occurs that necessitates an emergency landing, then the emergency landing is to be reported as a Incident and the *40+ hour period re-sets* to begin again after the malfunction has been rectified.**

18.05 **Working towards establishing the performance figures of a New amateur-constructed Compliant Two-seater or Single-seat gyro required for ASRA Form F022 Part (b) (pages 8 to 11).** Once an owner-pilot of a new-amateur-build Compliant two-seat or single-seat gyroplane has sufficient confidence with and understanding of their gyro to begin to record the performance figures of the machine, they should carefully progress to recording the various airspeeds, climb and descent rates, and take-off and landing distances.

18.06. Originally, it was intended that the information for inclusion in the F022 Part (b) would be gathered within the first 40 hours, but history and widespread experience shows that it often takes many additional tens of hours more before a gyro is properly "sorted out." Accordingly, a gyro can be kept as "Provisional" for as long as needed to properly sort out the machine performance-wise.

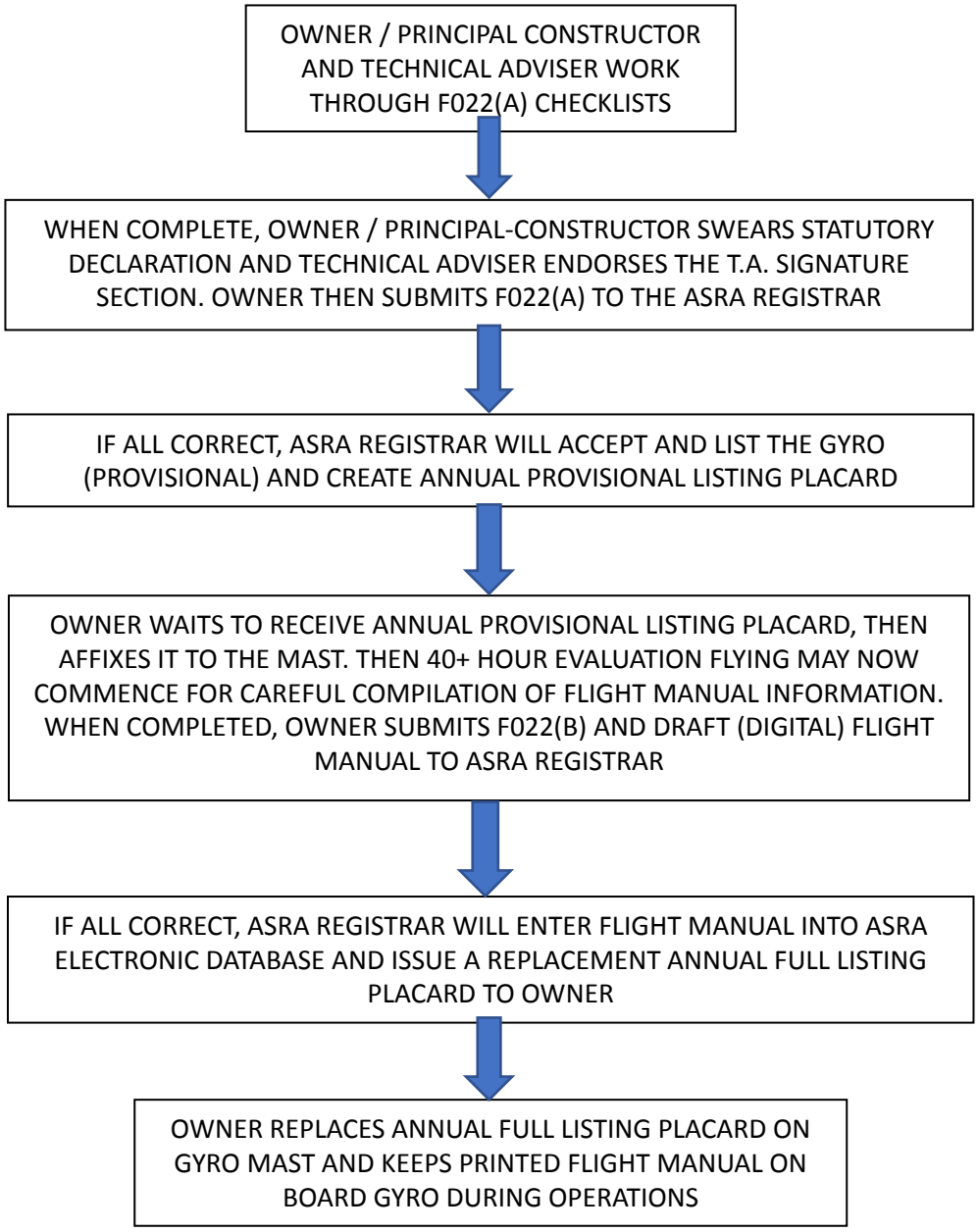
Standard ISA Conditions required.

18.07 It must also be carefully noted that the performance figures of the gyro for inclusion in the F022 Part (b) must be established at or very close to ISA standard temperatures and pressures of 60 deg Fahrenheit (15 deg C) and 1013 Mb at or near sea level.

ACCEPTANCE AND LISTING FLOWCHART ON NEXT PAGE

FLOWCHART

NEW TWO-SEAT (OR HEAVIER SINGLE-SEAT) "COMPLIANT" GYROS ACCEPTANCE AND LISTING SEQUENCE SUMMARY



Section 19

NEW COMMERCIALLY-MANUFACTURED TWO-SEATERS OR SINGLE-SEATER GYROPLANES

ACCEPTANCE AND LISTING

- IN CURRENT SERIAL-PRODUCTION -

"FIRST-OF-TYPE" PROTOCOL (40+ HOUR FLYOFF)

ASRA's Head of Flight Operations (HOFO) must personally specify the Technical Adviser or Senior Technical Adviser who does the initial inspection if the gyroplane is "First-of-Type"

19.01 When a importer or and owner desires that their newly-imported or newly-manufactured gyroplane in current serial production be assessed as the **first-of-type** for others to follow, ASRA has developed a "first-of-type" protocol that will benefit the owners of all subsequent copies of the machine.

Reminder of the advantage of "Type Acceptance"

19.02 Once a first-of-type has achieved Acceptance and Listing, the advantage for owners of subsequent identical copies of the firs-of-type is that they are NOT REQUIRED to undergo a 40+ hour Flyoff, but rather, all subsequent identical copies imported or manufactured will be Accepted and Listed using the streamlined **ASRA Form F006 process**, which only requires a **5+ hour "Shakedown" flight evaluation for new machines.**

"First-of-Type" **40+** hour Flyoff period for new-commercially-built Compliant Two-Seater or Single-seat Gyros

19.03. **New Commercially-built Compliant Two-seater or Single-seat Gyro imported as a "First-of-Type".** If an ASRA member imports a new "First-of-Type" Commercially-built Two-seat gyroplane, that machine – once Listed – will be subject to a 40+ hour flyoff period where the owner-pilot is then free to start flying their gyro solo (at their own risk). The initial Listing classification will be "Provisional" because the initial Listing will only have been processed using ASRA Form F022 Pages 2 through 7, known as Part (a).

19.04. During the 40+ hour flyoff period, with two-seaters the second-occupant seat is to be ballasted using a large rucksack or similar item weighted to simulate the eventual anticipated usual 2nd occupant of the machine.

19.05 **For 2-seaters, the carriage of a 2nd occupant is normally prohibited during a Flyoff period. This requirement can only be varied in writing (ie, email) by the HOFO for specific safety-related reasons during specified evaluation flights where another pilot-certificate holder may be carried for specified data acquisition or data-gathering purposes.**

> **NOTE: If, during the 40+ hour Flyoff period, a malfunction occurs that necessitates an emergency landing, then the emergency landing is to be reported as a Incident and the *40+ hour period re-sets* to begin again after the malfunction has been rectified.**

19.06 Subject to the above paragraph 18.03**,** ASRA mandates that the first 40 hours of a new Commercially-built imported "First-of-Type" Compliant Two-seat or Single-seater gyroplane's operational life is to be undertaken very carefully and cautiously, using incremental steps where the owner-pilot gradually and conservatively **VERIFIES whether the manufacturer's Flight Manual performance and handling date for their gyroplane matches real-life operational experience**.

19.07 ASRA requires "Fly Off" activities be confined to a defined geographical area, and be confined to near the home field, or no further afield than within easy retrieval distance in case a precautionary landing needs to be made. ASRA also strongly suggests that initial flying always be done while other people are around, so that assistance can be available if precautionary landings are needed.

19.08 **Working towards verifying the manufacturer's Flight Manual performance figures of an Imported New Commercially-built "First-of-Type" Compliant Two-seat gyro required for ASRA Form F022 Part (b) (pages 8 to 11).** Once an owner-pilot of an imported new Commercially-manufactured "First-of-Type" compliant Two-seat or Single-seat gyroplane has sufficient confidence

with and understanding of their gyro to begin to verifying the manufacturer's performance figures of the machine, they should carefully progress to independently establishing and recording the various airspeeds, climb and descent rates, and take-off and landing distances. Any variation between the Manufacturer's Flight Manual performance figures and the real-world performance figures acquired during the 40+ hour Flyoff period is to be notified to the HOFO and the HAM.

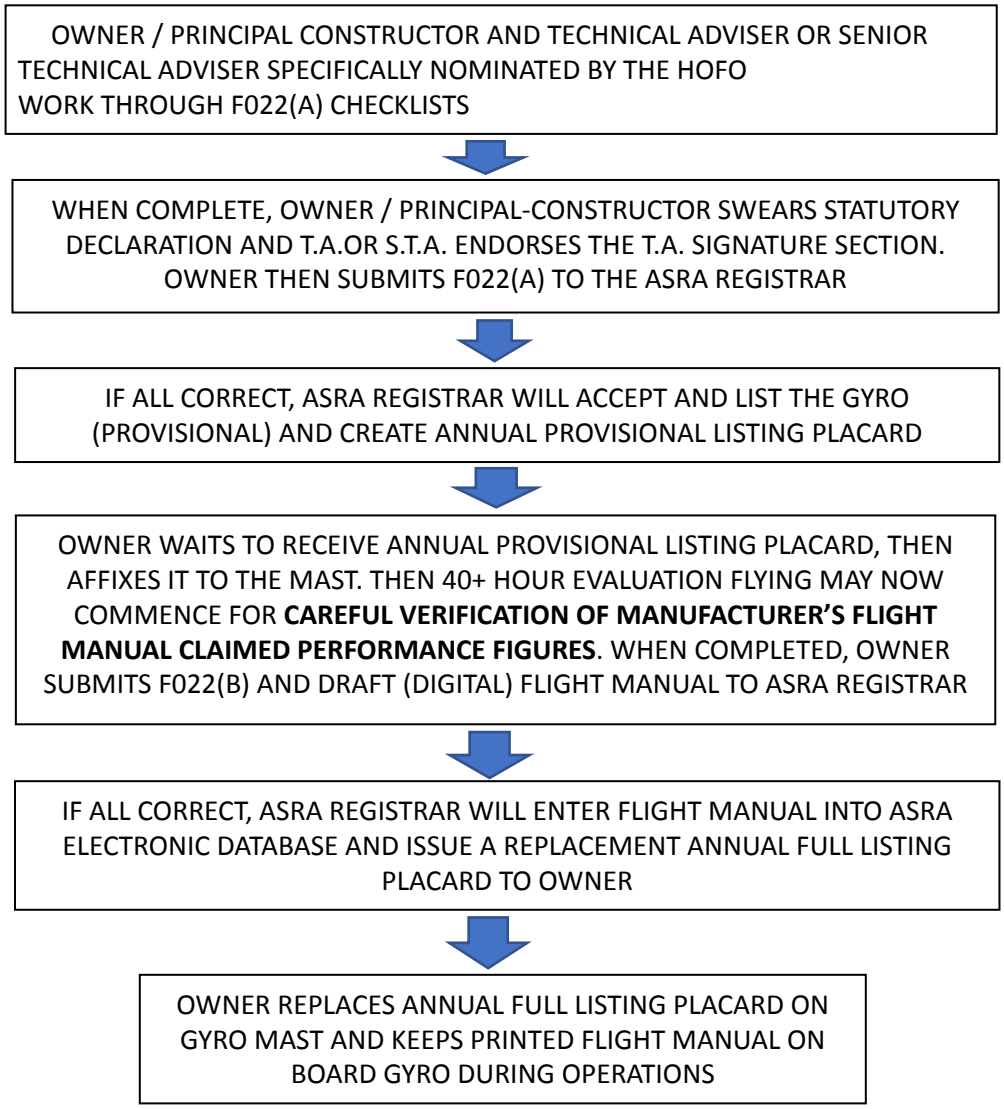
Owners must be careful to gather performance figures in Standard ISA conditions.

19.09 It must also be carefully noted that the performance figures of the gyro for inclusion in the F022 Part (b) must be established at or very close to ISA standard temperatures and pressures of 60 deg Fahrenheit (15 deg C) and 1013 Mb at or near sea level.

NOTE: A Two-seat Compliant gyroplane with Provisional Listing cannot be used for flight training.

FLOWCHART

"FIRST-OF-TYPE" ACCEPTANCE AND LISTING SEQUENCE SUMMARY



IMPORTANT NOTE: Once a "First-of-Type Protocol" has been undertaken for a gyroplane and ASRA Type Acceptance has been achieved, subsequent examples of that gyroplane Type can be accepted and Listed via the abbreviated F006 Listing process for established Types.

The following 15 pages set out the F022(a) and (b) documents.

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INCORPORATED

F022 Acceptance & Listing Protocols – **NEW** Compliant Gyroplanes
Record of Inspection and Evaluation Processes
Statutory Declaration of Compliance with Standards

ABN 53 412 417 012

This document can either be filled out progressively as the inspection and evaluation are completed or may be filled in at the completion of the said inspection and evaluation by transferring data from contemporaneous testing records. Inspection and evaluation will need to be done in two parts. Form F022 part (a) must be completed and signed off before a Limited Flight Status Acceptance & Listing (Provisional) can be issued. This limited flight status is to allow the specified flight evaluation to be completed before a Full Flight Status Acceptance & Listing (Compliant) can be issued. The flight evaluation is recorded in Form F022 part (b).

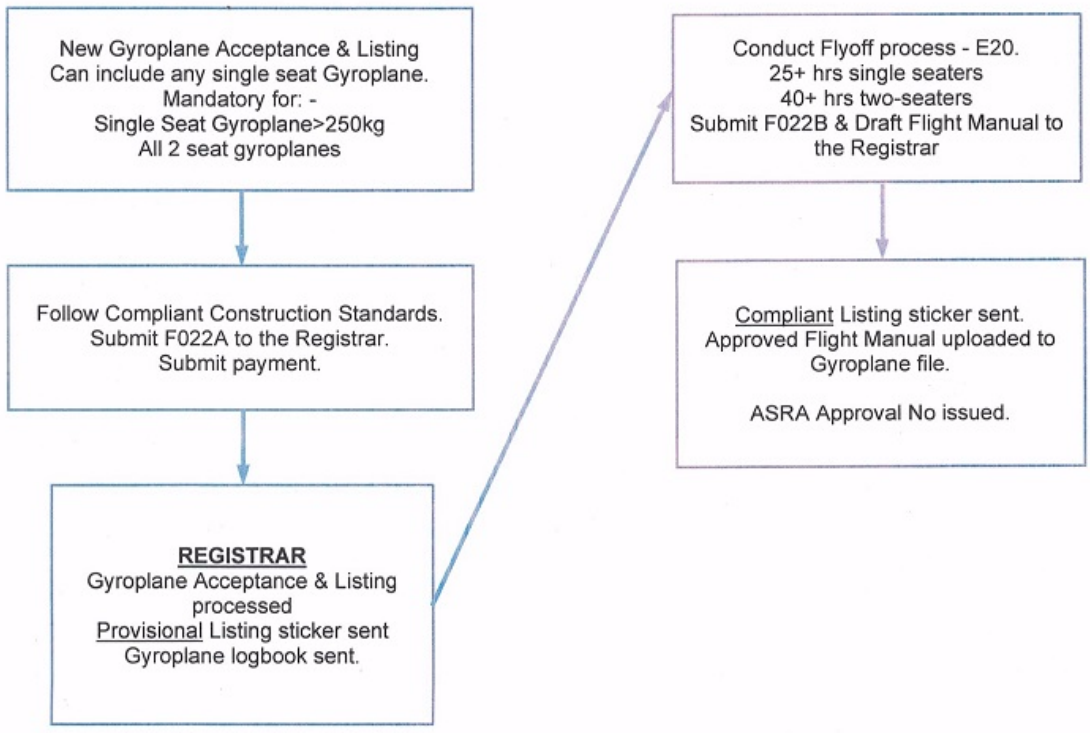
The person whose initials and signature are affixed to this document is to be that of the person who is the **Principal Constructor or a Factory Authorised Representative**. If flight evaluation is undertaken by a person who is not the principal constructor, the principal constructor MUST satisfy themselves of the integrity and accuracy of the performance-related information entered into this document. Where in-flight performance figures are concerned, the principal constructor shall ensure the accuracy of the figures either by contemporaneously and accurately recording instrument readings radioed to him or her by the pilot undertaking the relevant sequence or by the recording of instrument readings by electronic means such as readouts, traces or even a simple video camera recording of the relevant instrument or instruments. The principal constructor is also personally responsible for the accuracy and integrity of all external observations (such as take-off distance to 50' AGL, or landing distance from 50' AGL).

Form F022 is to be used in conjunction with the ASRA Construction Standards for Compliant Gyroplanes.

This form provides a means of recording that each inspection and evaluation process has been satisfactorily completed. A space is provided after each item for the evaluator's initials.

The **Principal Constructor or a Factory Authorised Representative** is the **ONLY** person entitled to initial the **'PC Initials'** boxes. Several sections have **'TA Initials'** boxes to the right of the principal constructor initials boxes. These 2nd boxes are **ONLY** to be used by ASRA Technical Advisers who are checking the integrity of the Principal Constructor's assertion made in that relevant sub-section. For the purposes of this document, the Principal Constructor and the countersigning Technical Adviser cannot be the same person.

The flow chart below represents the steps to follow to obtain final Compliant Acceptance & Listing.



Form F022 part (a) Construction and Testing before flight evaluation

Principal Constructor: .....

Some appendices are provided giving conversion information.

Gyroplane Listing No. **G** Airframe Serial No.

Subpart B	Initials	
Weight and Balance	PC	TA
B10. Hang Test 1 UP ..... 2 UP ..... Degrees nose down		----
Details of Hang Test entered into the Flight Manual		
B15. Maximum Selected Weight ..... kg.		----
Maximum Weight entered into the Flight Manual		
B20. Empty Weight. ..... kg		----
Empty Weight and conditions of test entered into the Flight Manual		
B25. Removable Ballast complies with C105		----
B30. Tilt Back Test Distance in cm between the propeller thrust line and the vertical centre of gravity		----
Single seater Full tank ..... cm Empty tank ..... cm		----
Two seater Empty tank 1 up ..... cm Full tank 1 up ..... cm		----
Empty tank 2 up ..... cm Full tank 2 up ..... cm		----
Printed/digital photos to be submitted with section F022(a)		

Subpart C		
STRUCTURE		
C5(c). These requirements have been met		----
C15. Strength and Deformation requirements have been met		----
C20. Compliance has been shown by:		
.....		----
FLIGHT LOADS		
C25(b). Compliance with flight load factors has been shown by:		
.....		----
C30. Compliance with the limit manoeuvring load factors shown by:		
.....		----
C40 Yawing Conditions requirements have been met by:		
.....		----
C45 Engine Torque requirements met by:		
.....		----
C50 Side Load of Engine Mount requirements met by:		
.....		----

	Initials	
CONTROL SURFACES AND SYSTEM LOADS	PC	TA
C55 Primary Control System requirements have been met by:		----
C60 Limit Pilot Forces requirements have been met by:		----
C70 Secondary Control Systems are satisfactory		----
STABILISING AND CONTROL SURFACES		
C75 Control Surface Loading requirements have been met by:		----
GROUND LOADS		
C85 Landing Gear - energy absorption requirements have been met by: Note the TA must witness the drop test		
MAIN COMPONENT REQUIREMENTS		
C90 Rotor Structure requirements have been met by:		----
C95 Fuselage, Landing Gear and Rotor Pylon Structures requirements met by:		----
EMERGENCY LANDING CONDITIONS		
C100 The emergency landing conditions requirements have been met by:		----
OTHER- LOADS		
C105 The loads from single masses requirements have been met by:		----
Subpart D		
Design and Construction		
D10 The materials used are satisfactory		----
D15 Fabrication Methods are satisfactory		
D20 Locking of Connections is satisfactory		
D25 The Protection of Structure is satisfactory		
D30 Provisions for inspection is satisfactory		
D35 Provisions for Rigging and De-rigging are satisfactory		
D40 Material Strength, Properties and Design Values requirements are met by:		----
D45 Fatigue Strength requirements are met by:		----
D50 Special Factors of Safety requirements met by:		----

		Initials PC	TA
D55	Casting Factor requirements met by:		----
D60	Bearing Factor requirements met by:		----
D65	Fitting Factor requirements met by:		----
D70	Cable Factor requirements met by:		----

CONTROL SURFACES AND ROTORS

D80	Rotor Blade drainage is satisfactory		
D85	Control Surface Installations are satisfactory		
D90	Control Surface Hinge requirements met by:		----
D95	Mass Balance requirements met by:		----
D100 (b).	Rotor Hub Tilt Range Fore/Aft ..... deg Side/Side ..... deg		
D100 (c).	Hub Bar Teeter Range ..... degrees		
D102	Rotor Clearance .....mm Clear of Prop .....mm Clear of Tail		
D103	First of type Gyroplane Y / N Circle option		
D105	Rotor Head Bearings suitability determined by:		----

CONTROL SYSTEMS

D110	Controls movement satisfactory		
D115	Control stops are satisfactory		
D120	RESERVED	----	----
D125	Trim System is satisfactory		
D130	Control System is satisfactory		
D135	Control System Design is satisfactory		
D140	Spring Device Installation and operation is satisfactory		
D145	Cable Systems are satisfactory		
D150	Requirements for Control System Joints met by:		

COCKPIT DESIGN

D155	The Cockpit layout satisfactory		
D160	The Cockpit View is satisfactory		
D165	The design of Windshields Windows and Doors is satisfactory		
D170	The layout and design of Cockpit Controls is satisfactory		
D175	The Flight Controls operate in the correct sense.		

		Initials PC	TA
D180	The suitability of the Seats and their supporting structure has been determined by:		----
D185	The mounting and suitability of the Safety Harness(es) has been determined by:		
D190	The Protection from Injury requirements have been met		
D195	The Baggage Compartment requirements have been met by:		----
D200	The Emergency Exit requirements have been met		
D205	Cockpit Ventilation is satisfactory		
Subpart E - Powerplant			
E5	Powerplant Installation is satisfactory		
E15	The design of the Rotor Spin-up and Brake Systems is satisfactory		
	Limitations on the use of spin-up or brake systems have been entered into the Flight Manual		
E25	The Propeller Clearances are satisfactory		
E27	The Propeller materials and durability have been met		
FUEL SYSTEM			
E30	The Fuel System installation is satisfactory		
E35	The Fuel Flow requirements have been met		----
E40	The Fuel Quantity(s) have been determined and identified on fuel gauges		----
	The unusable fuel quantity has been entered into the Flight Manual		
E45	The integrity and surge characteristics of the Fuel Tanks is satisfactory		----
E50	A Fuel Tank Test was satisfactory		----
E55	The Fuel Tank Installation is satisfactory		
E60	The requirements for the Fuel Tank Sump have been met		
E65	The Fuel Tank Filler Connection location is satisfactory		
E70	The requirements for the Fuel Tank Vents have been met		
E75	The requirements for the Fuel Strainer or Filter have been met		
E80	The requirements for the Fuel System Lines and Fittings have been met		
E85	The requirements for the Fuel Valves and Controls have been met		
OIL SYSTEM			
E90	The suitability and capacity of the engine oil system has been determined by:		----
E95	The requirements for the Oil Tanks (if fitted) have been met		
E100	An Oil Tank Test was satisfactory		----
E105	The requirements for the Oil Lines and Fittings have been met		
COOLING			
E110(b)(c)	The requirements for the Cooling System installation have been met.		

		Initials	
EXHAUST SYSTEM		PC	TA
E120	The requirements for the Exhaust System have been met		
E125	The requirements of the Exhaust Manifold Piping and Silencing system have been met		
POWERPLANT CONTROLS AND ACCESSORIES			
E130	The requirements for Controls Located in the Engine Bay have been met		
E135	The requirements for the Engine Ignition System have been met		
E145	The requirements for an Engine Cowling have been met		----
Subpart F - EQUIPMENT			
F5	The requirements for Equipment Function and Installation have been met		
F10	The required Flight and Navigation Instruments are fitted		
F15	The required Powerplant Instruments are fitted		
INSTRUMENTS – INSTALLATION			
F25	Arrangement and Visibility of the navigation instruments is satisfactory		
F30	The requirements for the Pitot and Static Pressure Systems have been met		
F35	The requirements for the Powerplant Instruments have been met		
ELECTRICAL SYSTEMS AND EQUIPMENT			
F40	The requirements for the Installation and Battery Design have been met		
F45	The requirements for the Installation of Electric Cables and Equipment have been met		
F50	The requirements for the Installation of External Lights have been met		
MISCELLANEOUS EQUIPMENT			
F55	The requirements for the Installation of Airborne Radio and Radio Navigation Equipment have been met		

MARKINGS AND PLACARDS		Initials PC	Initials TA
G30	The requirements for Placards and Markings have been met except for Airspeed limitations		
G35	The requirements for Power-plant instrument markings have been met		
G40	The Compass deviation placarding requirements have been met		
G45	The requirements for Fuel Quantity Indicator marking have been met		
G50	The requirements for Control Markings have been met		
G55	The requirements for Miscellaneous Markings and Placards have been met		

The following is to be signed by the Operations Manager only when this form is the subject of a First of Type Gyroplane.

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INC

The ASRA Operations Manager or authorized delegate will be the only person permitted to sign-off first of type gyroplanes. The manufacturer will pay for ASRA expenses incurred in the inspection and subsequent signing off of the aircraft.

.....
(Signature)

.....
(Print Name - Operations Manager/Authorised Delegate)

A.....
(ASRA membership No)

.....
(Date)

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INC

GYROPLANE ACCEPTANCE & LISTING FORM

CASA Regulations state that only current financial ASRA members and Registrant are permitted to fly and register a Gyro

ABN 53 412 417 012

ASRA Membership No:	A	Gyroplane Listing No:	G	Airframe Serial No:	
Registrant Given Names:				Registrant Family Name:	
Address:				Phone No:	
Town:			State:	P/Code:	
Email:					

Cockpit:	☐ Open Frame	☐ Semi Enclosed	☐ Fully Enclosed	Empty weight including rotors:	kg
Places:	☐ One	☐ Two Side by Side	☐ Two Tandem	MTOW:	kg
Aircraft Status:	☐ Registered	☐ Unregistered	☐ Destroyed	Gyroplane Primary Colour:	
Hang Test: 1 UP	Degrees	☐ Nose up	Controls Fore/Aft Angle:	Controls Side/Side Angle:	Total Teeter Angle:
Hang Test: 2 UP	Degrees	☐ Nose down			
Gyroplane Manufacturer:		Model:		Model No:	
Main Frame Material:	Size: mm	Mast Material:	Size: mm		
Frame Plates Material:	Thickness: mm				
Vertical Tail Type & Area:	☐ Rudder & Fin	☐ Full Flying	☐ Twin Tail	☐ Tri Tail	
	Total Vertical Tail Area: m^2	Horizontal Distance from C of G: m			
Pitch Stabiliser Location & Area:	☐ In propeller slipstream	☐ Outside propeller slipstream			
	Stabiliser Area: m^2	Horizontal Distance from C of G m			
Rotor Head Manufacturer:		Serial No:			
Rotor Blade Manufacturer:		Rotor Blade Model:	Length: ft		
Hub Bar Serial No:	Rotor Blade Serial Nos:	Blade 1	Blade 2		
Propeller Manufacturer	Serial No:	Diameter: in			
Engine Manufacturer	Type:	Engine No:	Engine Capacity: cc		
Redrive Make:	Serial No:	Ratio: : 1			
Fuel Tank Manufacturer	Capacity: LTS				

Mandatory Instruments	☐ ASI	☐ Altimeter	☐ Fuel Indicator	☐ Yaw Indicator	
Compliant Gyroplanes Mandatory Instruments	☐ Hour Meter	☐ Oil Pressure (4 stroke)	☐ Engine tacho		
	☐ Compass	☐ Volts (Battery Ignition)	☐ Temperature		
Significant Extras	☐ GPS	☐ Transponder	☐ ELT	☐ VHF	☐ UHF

☐ **Mandatory photos from the side**

NOTE: Upon completion of the inspection above, complete the Statutory Declaration below, have the Technical Adviser complete the statement below, then forward (post or email) these together with the appropriate fee and photos to the ASRA Registrar at registrar@asra.org.au or to the address found on the www.asra.org.au website.

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INC

Statutory Declarations Act 1959 (Commonwealth).

COMMONWEALTH OF AUSTRALIA

Statutory Declaration

I, ... (insert printed full name of Principal Constructor) ..... (insert occupation)

of ..... (insert residential address of Principal Constructor)

do solemnly and sincerely declare that:

(1) in placing my initials in the check box adjacent to each sub-section and now upon finally signing this my declaration, I hereby attest that the materials, construction techniques, fittings, structural configuration, and overall design of the gyroplane I seek to register as a Limited Flight Status gyroplane, for the flight evaluation specified in the ASRA document, Construction Requirements for Compliant Gyroplanes, has been carefully reviewed by me for compliance with the published standards.

(2) the information contained in the narrative or comment portions of this record of inspection and evaluation has been acquired personally by me or under my supervision and I hereby attest that I have taken all reasonable steps to ensure its accuracy and reliability;

and I make this solemn declaration by virtue of the Statutory Declarations Act 1959, and subject to the penalties provided by that Act for the making of false statements in statutory declarations, conscientiously believing the statements contained in this declaration to be true in every particular.

..... (Signature of Principal Constructor) ..... (Initials of Principal Constructor)

Declared at ..... (Place) on the ..... (Date) day of ..... (Month/Year)

Before me, ... (signature of person witnessing declaration)

..... (Print full name of witness)

..... (Professional address)

..... (category of entitlement to witness declarations. See next page)

The Statutory Declarations Regulations provide for a statutory declaration under the *Statutory Declarations Act 1959* to be made before the following persons:

(1) a person who is authorised under a law in force in a State or Territory to practise as a member of any of the following professions:

- Chiropractor
- Dentist
- Legal practitioner
- Medical practitioner
- Nurse
- Patent attorney
- Pharmacist
- Veterinary surgeon

(2) any of the following persons:

- Agent of the Australian Postal Corporation who is in charge of an office supplying postal services to the public
- Australian Consular Officer, or Australian Diplomatic Officer, (within the meaning of the *Consular Fees Act 1985*)
- Bailiff
- Bank officer with 5 or more continuous years of service
- Building society officer with 5 or more years of continuous service
- Chief executive officer of a Commonwealth court
- Civil marriage celebrant
- Clerk of a court
- Commissioner for Affidavits
- Commissioner for Declarations
- Credit union officer with 5 or more years of continuous service
- Holder of a statutory office not otherwise specified in this list
- Judge of a court
- Justice of the Peace
- Magistrate
- Master of a court
- Member of the Australian Defence Force who is:
  (a) an officer; or
  (b) a non-commissioned officer within the meaning of the *Defence Force Discipline Act 1982* with 5 or more years of continuous service; or
  (c) warrant officer within the meaning of that Act
- Member of the Institute of Chartered Accountants in Australia, the Australian Society of Certified Practicing Accountants or the National Institute of Accountants
- Member of the Institute of Corporate Managers, Secretaries and Administrators
- Member of the Institution of Engineers, Australia, other than at the grade of student
- Member of:
  (a) the Parliament of the Commonwealth; or
  (b) the Parliament of a State; or
  (c) a Territory legislature; or
  (d) local government authority of a State or Territory
- Minister of religion registered under Division 1 of Part IV of the *Marriage Act 1961*
- Notary public
- • Permanent employee of:
  (a) the Commonwealth or of a Commonwealth authority; or
  (b) a State or Territory or of a State or Territory authority; or
  (c) a local government authority; with 5 or more years of continuous service who is not otherwise specified in this list
- Permanent employee of the Australian Postal Corporation with 5 or more years of continuous service who is employed in an office supplying postal services to the public
- Person before whom a statutory declaration may be made under the law of the State or Territory in which the declaration is made
- Police officer
- Registrar, or Deputy Registrar, of a court
- Senior Executive Service officer of the Commonwealth, or of a State or Territory, or of a Commonwealth, State or Territory authority
- Sheriff
- Sheriff's officer
- Teacher employed on a full-time basis at a school or tertiary education institution

ASRA TECHNICAL ADVISERS RECORD OF VERIFICATION
F022 part (a)

I hereby certify that I have undertaken an examination of the gyroplane subject of this Record and have inserted my initials in the relevant check boxes (where applicable) as an indication that (as far as can be ascertained by visual and/or manual examination) the entry made by the Principal Constructor in the sub-section adjacent to the check box appears to be true and correct.

....
(Signature of TA) (Initials of TA)

..... A.....
(Print Name of TA) (ASRA Membership No)

.....
(Date)

***** Gyroplane will be registered as Provisional until the mandatory flight endurance, draft flight manual and the F022B have been submitted.**

Form F022 part (b) Flight and Performance Evaluation

Note: part (a) of this form must be completed and the gyroplane registered for limited flight status before commencing flight and performance testing.

Principal Constructor: .....**Listed No. G**.....

Evaluation Pilot: ..... **ASRA Membership No. A**.....

	Initials PC	Initials TA
B32. Rotor Speed Limits ..... RPM Determined by:		
.....		- - - -
Rotor speed limit entered into the Flight Manual		
PERFORMANCE		
B40. Take-off Distance Without Prerotator .....m. With Prerotator .....m.		- - - -
The Take-off Distance entered into the Flight Manual		
B45. Climb Rate Time taken to 1000 ft .....min.		- - - -
The corrected sea level Climb Rate entered into the Flight Manual		
B50. Minimum Sink Rate .....KIAS Rate of descent .....ft/Min		- - - -
Minimum Sink Rate @KIAS = ft/min entered into the Flight Manual		
B52. Best Glide Ratio .....KIAS Rate of descent .....ft/Min		- - - -
Best Glide Ratio @KIAS = X.X:1 entered into the Flight Manual		
B55. Actual straight-and-level steady top airspeed at 1000' agl established as .....KIAS		- - - -
Actual straight-and-level steady top airspeed at 1000' agl entered into the Flight Manual		
B60. Minimum Controllable Speed for Level Flight (VMIN) determined as .....KIAS		- - - -
The (VMIN) entered into the Flight Manual		
B65. Best Rate of Climb Airspeed (VY) determined as .....KIAS		- - - -
The details of (VY) entered into the Flight Manual		
B70. Landing Distance from 50 ft altitude .....m at .....KIAS		- - - -
The Landing Distance entered into the Flight Manual		
B75. Maximum Operating Altitude established as .....Feet		- - - -
The Maximum Operating Altitude entered into the Flight Manual		
B80. Height/Velocity Envelope established as .....ft at .....KIAS		- - - -
Height/Velocity Envelope Graph entered into the Flight Manual		

CONTROLLABILITY AND MANOEUVRABILITY

B85 (a), (b) & (c). General Controllability and Manoeuvrability is satisfactory		- - - -
B85 (d) landing at maximum all up weight, with the engine at idle demonstrated		- - - -
The procedure for B85(d) recorded in the Flight Manual		
B85 (e) pitch stability satisfactory		- - - -

	INITIALS PC	TA
B90 (a), (b) & (c). Longitudinal Lateral and Directional Control is satisfactory and control forces not exceeded.		----
B90 (d) A maximum operating wind speed of ..... Knots has been established		----
A maximum cross wind speed of ..... Knots has been established		----
A maximum tail wind speed of ..... Knots has been established		----
The wind speeds established in B90(d) have been entered in the Flight Manual		
B95. The Pitch Control Forces are satisfactory		----

STABILITY

B100. General stability is satisfactory		----
B105. Longitudinal Stability is satisfactory		----
B110. Lateral and Directional Stability is satisfactory		----
B115. Dynamic Longitudinal Stability is satisfactory		----

GROUND HANDLING CHARACTERISTICS

B120. Directional Stability and Control is satisfactory		----
B125. Taxiing control is satisfactory		----
B125(b). The maximum taxiing speed over rough ground is ..... knots		----
The maximum ground speed on take-off is ..... knots		----
The maximum ground speed on landing is ..... knots		----
The ground speeds established in B125(b) have been entered into the Flight Manual		
B127. No tendency to oscillate on the ground		----

MISCELLANEOUS FLIGHT REQUIREMENTS

B130. The gyroplane is free from excessive vibration.		----
D75 The Flutter and Resonance requirements met by:		

Subpart E - Powerplant

E10 Compatibility has been determined by:		

E20 The Flight Endurance Test has been satisfactorily completed		----

COOLING

E110(a) The performance requirements for the Cooling System installation have been met determined by:		----

	Initials	
INDUCTION SYSTEM	PC	TA
E115 The performance of the Air Induction system have been determined by:		
.....		----
POWERPLANT CONTROLS AND ACCESSORIES		
E140 The requirements for Propeller Speed have been met		----
Subpart G		
Operating Limitations and Information		
G5 The Operating Limitations have been entered into the Flight Manual		
G10 Air-speed limitations are stated in terms of indicated air-speed		
G15 The requirements for Weight and Balance have been met		
G20 Powerplant and Propeller Limitations have been determined		----
Powerplant and Propeller Limitations have been entered in the Flight Manual		
G25 The Gyroplane Flight Manual has been produced and a hardcopy and electronic copy (*.doc) have been supplied to the ASRA Registrar.		
MARKINGS AND PLACARDS		
G30 The requirements for Placards and Markings have been met		
G35 The requirements for Airspeed and Power-plant instrument markings have been met		
G45 The requirements for Fuel Quantity Indicator markings have been met		
G50 The requirements for the Control markings have been met		
G55(b)(c) The requirement for fuel markings has been met		
G55(e) The CASA occupant warning placard has been fitted		

NOTE: Upon satisfactory completion of parts (a) and (b) of this form, complete the Statutory Declaration below, have the Technical Adviser complete the statement below, then forward (post or email) these together with the appropriate fee and photos to the ASRA Registrar at registrar@asra.org.au or the address found on the www.asra.org.au website.

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INC

Statutory Declarations Act 1959 (Commonwealth).

COMMONWEALTH OF AUSTRALIA

Statutory Declaration

I, ... (insert printed full name of Principal Constructor) ..... (insert occupation)

of ..... (insert residential address of Principal Constructor)

do solemnly and sincerely declare that:

(1) in placing my initials in the check box adjacent to each sub-section and now upon finally signing this my declaration I hereby attest that the materials, construction techniques, fittings, structural configuration, and overall design and performance of the gyroplane I seek to register as a Limited Flight Status gyroplane, for the flight tests specified in the ASRA document Construction Requirements for Compliant Gyroplanes, has been carefully reviewed by me for compliance with the published standards.

(2) the information contained in the narrative or comment portions of this record of inspection and testing has been acquired personally by me or under my supervision and I hereby attest that I have taken all reasonable steps to ensure its accuracy and reliability;

and I make this solemn declaration by virtue of the Statutory Declarations Act 1959, and subject to the penalties provided by that Act for the making of false statements in statutory declarations, conscientiously believing the statements contained in this declaration to be true in every particular.

..... (Signature of Principal Constructor) ..... (Initials of Principal Constructor)

Declared at ..... (Place) on the ..... (Date) day of ..... (Month/Year)

Before me, ... (signature of person witnessing declaration)

..... (Print full name of witness)

..... (Professional address)

..... (category of entitlement to witness declarations. See next page)

The Statutory Declarations Regulations provide for a statutory declaration under the *Statutory Declarations Act 1959* to be made before the following persons:

(1) a person who is authorised under a law in force in a State or Territory to practise as a member of any of the following professions:

- Chiropractor
- Dentist
- Legal practitioner
- Medical practitioner
- Nurse
- Patent attorney
- Pharmacist
- Veterinary surgeon

(2) any of the following persons:

- Agent of the Australian Postal Corporation who is in charge of an office supplying postal services to the public
- Australian Consular Officer, or Australian Diplomatic Officer, (within the meaning of the *Consular Fees Act 1985*)
- Bailiff
- Bank officer with 5 or more continuous years of service
- Building society officer with 5 or more years of continuous service
- Chief executive officer of a Commonwealth court
- Civil marriage celebrant
- Clerk of a court
- Commissioner for Affidavits
- Commissioner for Declarations
- Credit union officer with 5 or more years of continuous service
- Holder of a statutory office not otherwise specified in this list
- Judge of a court
- Justice of the Peace
- Magistrate
- Master of a court
- Member of the Australian Defence Force who is:
  (a) an officer; or
  (b) a non-commissioned officer within the meaning of the *Defence Force Discipline Act 1982* with 5 or more years of continuous service; or
  (c) warrant officer within the meaning of that Act
- Member of the Institute of Chartered Accountants in Australia, the Australian Society of Certified Practicing Accountants or the National Institute of Accountants
- Member of the Institute of Corporate Managers, Secretaries and Administrators
- Member of the Institution of Engineers, Australia, other than at the grade of student
- Member of:
  (a) the Parliament of the Commonwealth; or
  (b) the Parliament of a State; or
  (c) a Territory legislature; or
  (d) local government authority of a State or Territory
- Minister of religion registered under Division 1 of Part IV of the *Marriage Act 1961*
- Notary public
- • Permanent employee of:
  (a) the Commonwealth or of a Commonwealth authority; or
  (b) a State or Territory or of a State or Territory authority; or
  (c) a local government authority; with 5 or more years of continuous service who is not otherwise specified in this list
- Permanent employee of the Australian Postal Corporation with 5 or more years of continuous service who is employed in an office supplying postal services to the public
- Person before whom a statutory declaration may be made under the law of the State or Territory in which the declaration is made
- Police officer
- Registrar, or Deputy Registrar, of a court
- Senior Executive Service officer of the Commonwealth, or of a State or Territory, or of a Commonwealth, State or Territory authority
- Sheriff
- Sheriff's officer
- Teacher employed on a full-time basis at a school or tertiary education institution

ASRA TECHNICAL ADVISER'S RECORD OF VERIFICATION
F022 part (b)

I hereby certify that I have undertaken an examination of the gyroplane subject of this Record and have inserted my initials in the relevant check boxes (where applicable) as an indication that (as far as can be ascertained by visual and/or manual examination) the entry made by the Principal Constructor in the sub-section adjacent to the check box appears to be true and correct.

....
(Signature of TA) (Initials of TA)

..... A.....
(Print Name of TA) (ASRA Membership No)

.....
(Date)

Section 20

TWO-SEAT & SINGLE-SEAT COMPLIANT GYROPLANES

(Under CASR Part 103 known as '**Ultralight Gyroplanes**')

Procedures for

TRANSFERS OF OWNERSHIP BETWEEN ASRA MEMBERS

(Gyroplane becomes classified as second-hand)

MAIN POINTS –

(A) Once the new owner has actual custody and possession of the gyro the new owner is to contact a T.A. to inspect the gyro;

(B) A hang-test is compulsory for 2-seat side-by-side home-builds or builds-to-order. Hang tests for factory-produced tandem-seat or side-by-side gyroplanes that are not hybridized are NOT required; and

(C) The Listing of the gyroplane MUST be promptly transferred into the new owner's name once it is in their custody and possession – failure to do this could easily jeopardise ASRA's insurance cover in case of accident.

Second-hand

20.01. Most ultralight gyroplanes transacted or acquired in Australia are usually second-hand.

20.02. For technical administration purposes, the fact that a gyroplane has been acquired second-hand gives rise to several fairly obvious points:

(a) it can't be assumed that any "downstream" purchaser will have anywhere the in-depth knowledge of the gyroplane that the first owner had, ESPECIALLY if that first owner was the amateur-constructor or builder;

(b) therefore, it can't be assumed that the downstream purchaser will have technical skills and competencies matching that of the original constructor; and

(c) this fact may have implications in the maintenance, modification, and repair authorisations that a person might be granted. CAO 95.12 and 95.12.1 general conditions apply until the CASR Part 103 Manual of Standards commences. After Part 103 MOS commencement, a person must meet the eligibility criteria and competency standards set out by ASRA in this Technical Procedures Manual.

20.03. When the ownership of an ASRA Gyroplane is transferred, ASRA uses this transaction as an opportunity for a Technical Adviser to undertake a 3'd-party inspection of the gyroplane to ensure that the gyroplane continues to comply with the Gyroplane Construction Standards, whether Basic or Compliant.

20.04. This process is broadly similar to the "roadworthy" inspection process for motor vehicles that most States in Australia require for changes of ownership. A key difference, however, is that the responsibility for arranging the Technical Adviser inspection rests on the buyer - **NOT the seller**.

20.05. The reason for this is that ASRA's long experience has shown that sellers generally aren't particularly interested in the machine they are selling, whereas the buyers are normally keenly

interested and enthusiastic in every aspect of their new acquisition.

20.06 Accordingly, ASRA's policy is that the new owner should collaborate closely with a Technical Adviser to familiarise themselves with every nut and bolt of their acquisition. The Technical Adviser inspection is the golden opportunity for this new-owner familiarisation to occur.

20.07. The post-purchase Technical Adviser inspection is also the perfect opportunity for the new owner and the Technical Adviser to discuss any possible adjustments, refinements, or changes the new owner might be contemplating.

Hang-Testing compulsory for **Amateur-Constructed side-by-side 2-seaters**

20.08. ASRA requires a compulsory Hang-Test to be undertaken where the newly purchased second-hand gyroplane is an Amateur-Constructed 2-seater with side-by-side seating.

20.09. In addition to the normal hang-testing procedures detailed in the ASRA Gyroplane Construction Standards, particular attention should be paid to the following supplementary steps:

(1) The command seat (the seat from which the gyroplane will normally be flown solo – usually has best access to switches, instruments, and throttle) is to be ballasted with weight identical to the fully helmet, jacketed and gloved new owner. With the 2nd occupant seat vacant and no more than 10 litres in the fuel tank, the gyro is hoisted clear of the ground and clear well-focused digital photographs are taken from the front-on position (to show the lateral tilt hang angle) and the 90-degree side view (to show the nose-down hang angle).

(2) Gyro is then lowered and fuel tank completely filled and re-hoisted so that 2 more clear well-focused digital photographs of the lateral and nose-down hang-angles can be taken.

(3) 90kg ballast (ASRA Standard Occupant weight) then placed onto 2nd occupant seat. Gyro then hoisted clear of ground again and 2 more clear well-focused digital photographs of the lateral and nose-down hang angles can be taken.

(4) Gyro lowered to ground, then fuel drained to leave not more than 10 litres in the fuel tank. Gyro then re-hoisted and 2 more clear well-focused digital photographs of the lateral and nose-down hang angles can be taken.

20.10. The nose-down hang-angle is to be checked against the ASRA Construction Standard limits.

The ‘criticality’ of the lateral hang tilt angle

20.11. This supplementary hang-testing is **critical** in determining whether the lateral hang angle of the two-seater in any combination of one or two occupants, and full or nearing-empty fuel tanks is going to result in the gyroplane going out of limits.

20.12. Specifically, take the example of a two-seat gyroplane that has a “bench-seat”. History shows that occupants can easily sense if the seat is tilted left-side or right-side down but are usually unable to estimate by how much when sitting in the seat.

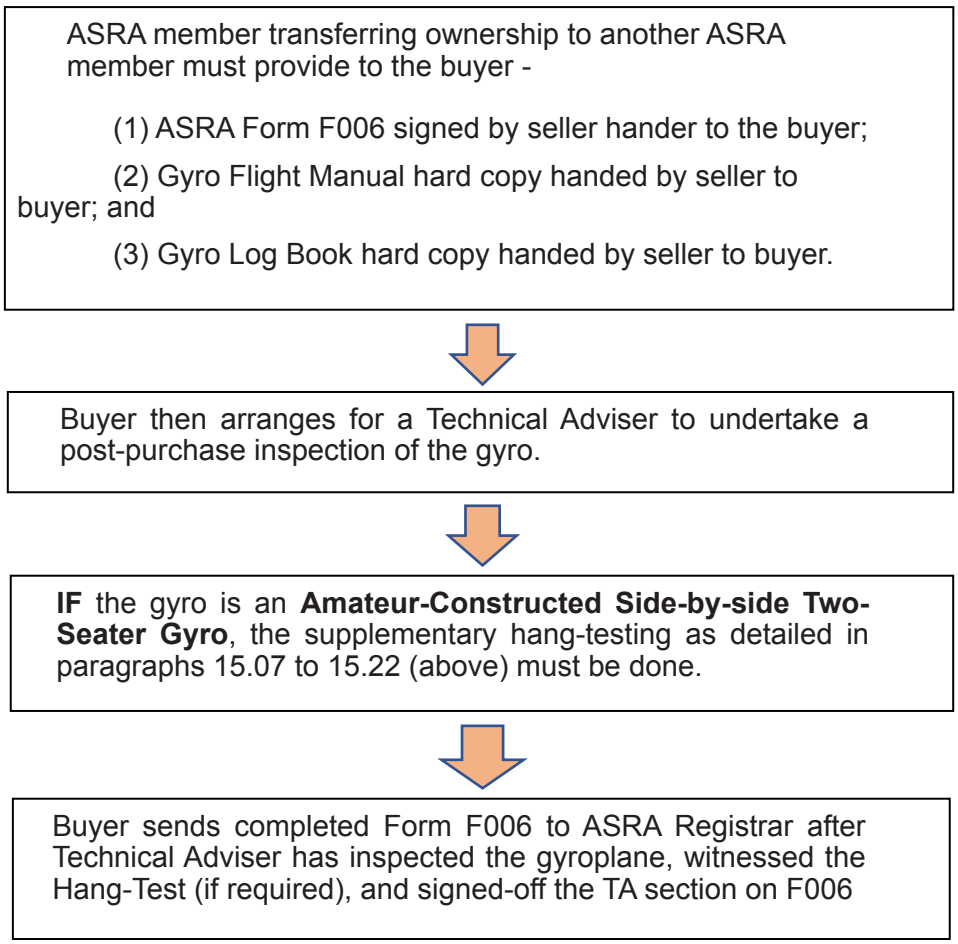
20.13. The supplementary hang-testing gives solid guidance about whether any tendency to laterally hang left-side down, or right-side down is getting out of limits. Particular care must also be taken to consider the effect of propeller torque on the machine – it should be noted that some manufacturers even offset the thrust line to compensate for torque and “P” effects.

20.14. Careful evaluation flying can also quickly reveal whether the gyro is laterally hanging left-side or right-side down. The pilot will notice the control stick needing to he held to one side or the other, which in reality is actually the control stick being held more or less vertically while the machine itself is laterally tilted.

20.15. Careful consideration needs to be taken about the likelihood of one mainwheel contacting the ground before the other, and also whether there is a likelihood that there might be insufficient lateral stick travel remaining during takeoff or landing (especially if the gyro is being operating from a narrow strip with a crosswind).

Transfers of Ownership - where the Seller and Buyer are current ASRA members transferring a Two-Seat Amateur-Constructed side-by-side seating gyroplane

20.16. The following sequence is to be followed:



ASRA's Form F006 - Gyroplane ownership transfer or sign-off after Major Modifications or Repairs

20.17. A copy of the Form F006 is set out on the following two pages.

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INC

F006 GYROPLANE OWNERSHIP TRANSFER or sign-off after MAJOR MODIFICATIONS or REPAIRS

CASA Regulations state that only current financial ASRA members and Registrant are permitted to fly and register a Gyro

ABN 53 412 417 012

ASRA Membership No:	A	**Gyroplane Listing No:**	G	**Airframe Serial No:**	
Registrant Given Names:				**Registrant Family Name:**	
Address:				**Phone No:**	
Town:			**State:**		**P/Code:**
Email:					

☐ **(A)** New Listing (Compliant Gyros only) or Renewal of Listing (only for expired registered gyros)

☐ **(B)** Transfer of ownership — The seller must advise ASRA of a change of ownership and enter the buyer details below. The Listing is suspended until the buyer submits the transfer fee and a TA inspection is signed or completed online.
***** The seller has provided the buyer with all documents and manuals pertaining to the gyroplane. *****

ASRA No:	A	Buyer Name:		Phone No:	
Address:			State:		P/Code:

☐ **(C)** Post-Component-Failure Inspection Notification ☐ **(D)** Post-Damage-Major Repair Inspection Notification

☐ **(E)** Notification of recent Major Modifications ☐ **(F)** Post-Grounding Order-Inspection ☐ **(G)** Other (add detailed comments and amend gyro details)

Cockpit:	☐ Open Frame	☐ Semi Enclosed	☐ Fully Enclosed		Empty weight including rotors:		kg
Places:	☐ One	☐ Two Side by Side	☐ Two Tandem		MTOW:		kg
Aircraft Status:	☐ Registered	☐ Unregistered	☐ Destroyed		Gyroplane Primary Colour:		
Hang Test: 1 UP	Degrees	☐ Nose up	Controls Fore/Aft Angle:		Controls Side/Side Angle:		Total Teeter Angle:
Hang Test: 2 UP	Degrees	☐ Nose down					
Gyroplane Manufacturer:			Model:		Model No:		
Main Frame Material:		Size: mm	Mast Material:		Size:	mm	
Frame Plates Material:		Thickness:	mm				
Vertical Tail Type & Area:	☐ Rudder & Fin	☐ Full Flying	☐ Twin Tail	☐ Tri Tail			
	Total Vertical Tail Area:	m^2	Horizontal Distance from C of G:	m			
Pitch Stabiliser Location & Area:	☐ In propeller slipstream		☐ Outside propeller slipstream				
	Stabiliser Area:	m^2	Horizontal Distance from C of G	m			
Rotor Head Manufacturer:			Serial No:				
Rotor Blade Manufacturer:			Rotor Blade Model:		Length:	ft	
Hub Bar Serial No:		Rotor Blade Serial Nos:	Blade 1		Blade 2		
Propeller Manufacturer		Serial No:		Diameter:	in		
Engine Manufacturer	Type:	Engine No:		Engine Capacity:	cc		
Redrive Make:		Serial No:		Ratio:	: 1		
Fuel Tank Manufacturer		Capacity:	LTS				

Section 21

Mandatory Instruments	☐ ASI	☐ Altimeter	☐ Fuel Indicator	☐ Yaw Indicator
Compliant Gyroplanes Mandatory Instruments	☐ Hour Meter	☐ Oil Pressure (4 stroke)	☐ Engine tacho	
	☐ Compass	☐ Volts (Battery Ignition)	☐ Temperature	
Significant Extras	☐ GPS	☐ Transponder	☐ ELT	☐ VHF ☐ UHF

TO BE COMPLETED BY AN ASRA TECHNICAL ADVISER
FOR ALL NOTIFICATIONS (A to F) inclusive.

I declare that I have inspected the above Gyroplane and checked that all the control movements are normal as specified in the applicable ASRA Inc. F022 or F024 registration protocols. The Gyroplane complies with all the compliance requirements and the Safety Directives issued by ASRA. Safety Directives can be accessed at https://www.asra.org.au/directives-and-alerts/ I take no responsibility for any modifications carried out after this date unless approved by me. I do not take any responsibility for the accuracy of the owner or manufacturer's statements, or the manner in which the Pilot operates the Gyro. This is an Application for Registration or Renewal and is not indicative of the flight readiness or performance of this aircraft

The Gyroplane qualifies for Listing under the following category:	☐ **Single Seat**			☐ **Two Seat**	
	☐ **Provisional**	☐ **Basic**	☐ **Compliant**	☐ **Provisional**	☐ **Compliant**
	Airframe Hours:	**HRS**	**Engine Hours:**		**HRS**

***If Compliant* - Manufacturers Type ASRA Approval No:** _____

Technical Adviser's Name: _____ Membership No: **A** _____

Signature: _____ Date: _____

Description of failure/damage/defect and general comments:

Registrant's Signature: **Date:** ☐ **Mandatory photos from the side and of any modified/repaired section of the gyroplane**

*** Registration will not be issued without a current photo***

Schedule of Fees

(Tick appropriate box) DO NOT SEND CASH

Acceptance and Listing 2022 (Registration expires 31st Dec 2022)	☐ **$31 (A)** includes Gyroplane maintenance logbook. TA inspection required
Transfer – Purchaser (Must be an ASRA member)	☐ **$31 (B)** TA inspection required

On receipt of your registration form an invoice will be sent to your email address.
Payment can be made online by credit card and EFT.

Alternatively, payments by cheque or Money Order are made payable to ASRA Inc.
Post Listing Form and cheque to: ASRA Registrar, PO Box 3070 Mandurah East WA 6210.
All documentation can be downloaded from the ASRA Website Members Zone https://www.asra.org.au/member-zone/

Contact the registrar@asra.org.au or 0407 929 479 if you have lost your log on details or do not have internet access.

RE-ACCEPTANCE AND RE-LISTING OF ANY ASRA GYROPLANE AFTER HAVING SUSTAINED MAJOR DAMAGE AND BEEN RE-BUILT

OR ANY PREVIOUSLY REGISTERED OR LISTED GYROPLANE THAT HAS DISAPPEARED FROM THE FINANCIAL GYRO LIST FOR MORE THAN 3 YEARS

(FRESH 40+ HOUR FLYOFFS REQUIRED FOR REBUILDS)

Major Accident Damage Rebuilds

21.01 Any ASRA Listed Gyroplane that has sustained Major Damage automatically has its Approval to Fly cancelled.

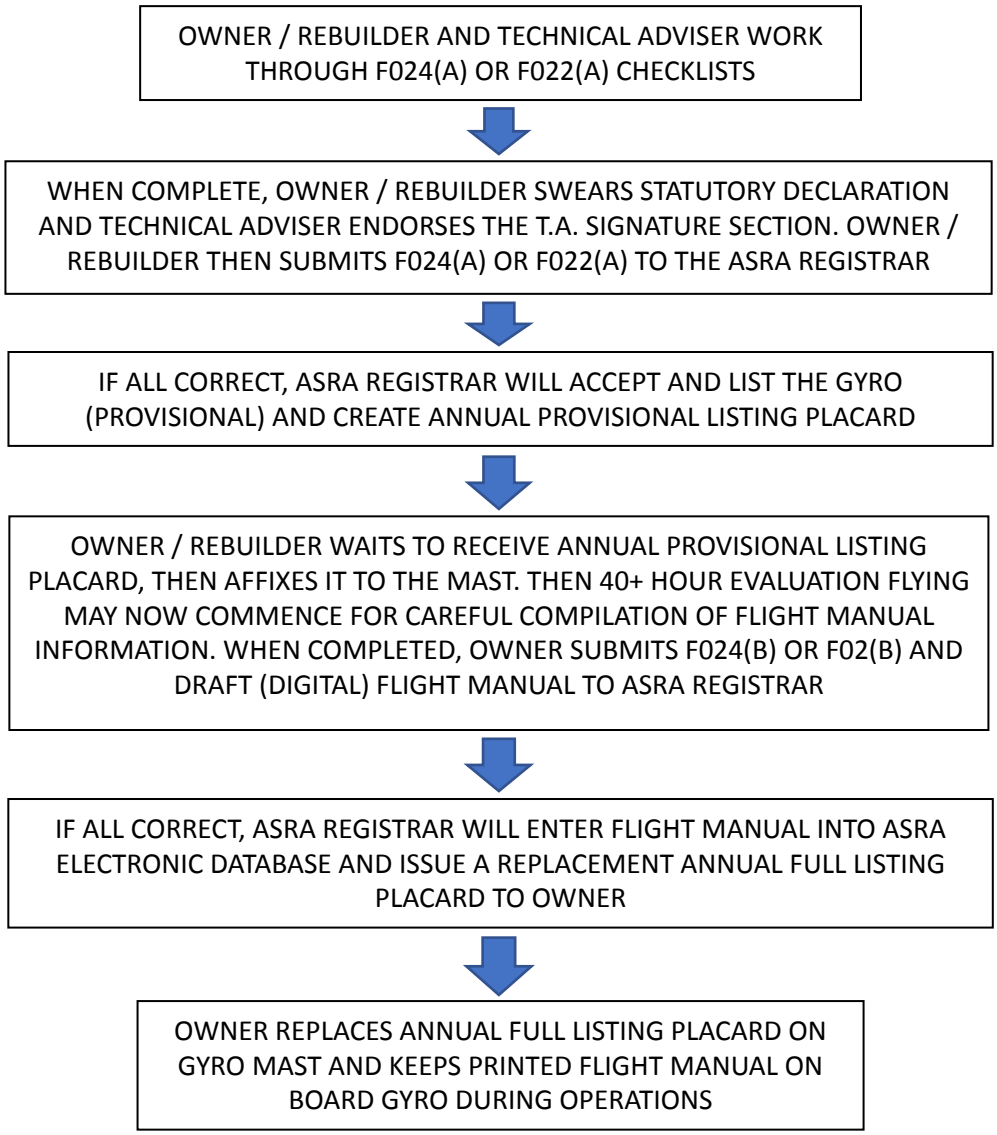
21.02 For Re-acceptance and Re-Listing the gyroplane MUST **be put through the full F024 parts (a) and (b), or the full F022 parts (a) and (b) assessment, inspection and evaluation processes**.

21.03 That will involve a full repeat 40-Hour Flyoff period. For two-seaters, a 2nd occupant is not permitted to be carried during the 40-hour Flyoff period. The sole exception to this requirement is where a commercially manufactured gyroplane has been repaired or rebuilt using factory OEM replacement parts under the supervision of the manufacturer's authorised local representative, in which case the **HOFO in consultation with the HAM** may reduce the 40-hour requirement to not less than a 10-hour "shakedown" after undertaking a risk-based review of the circumstances.

> **NOTE: If, during the 40+ Flyoff hour period, a malfunction occurs that necessitates an emergency landing, then the emergency landing is to be reported as a Incident and the *40+ hour period re-sets* to begin again after the malfunction has been rectified.**

FLOWCHART

ACCEPTANCE AND LISTING or RE-ACCEPTANCE AND RE-LISTING SEQUENCE SUMMARY



DE-LISTED GYROs (aka “Derelict Barn Finds” or “Gumtree Specials”)

De-Listed Gyros

21.04 As explained at page 43 of this Manual, there are two scenarios where a Listed gyro will be “De-Listed’. The detailed explanations are:

(a) If a Member fails to renew membership and gyro Listing Renewal, **by 1 APRILof the current year**, the ASRA Registrar will remove the Member’s Gyro or Gyros from the “suspended” category and re-classify the gyros as De-Listed. History shows that these gyros are usually then missing in action f(MIA) or months or years, before they re-appear, often on Gumtree. **THE PROBLEM FACING ASRA IS THAT THESE MACHINES HAVE BEEN OUT OF THE ASRA SYSTEM AND IN THE HANDS OF NON-MEMBERS WHO OFTEN TINKER AND MODIFY THE GYROS, SOMETIMES IN PREPOSTEROUS AND DANGEROUS WAYS**; and

(b) If a Member has remained continuously fully paid up as a member but has not financially renewed the Listing of one or more spare gyros that are sitting dormant in the member’s shed, then ASRA will not relegate those unpaid gyros into the “De-Listed” classification until they have been unpaid for **36 months**.

The decision about whether a simple F006 Transfer process can be used or the full F024 / F022 process is to be used is a **decision for the HAM in consultation with the HOFO.**

21.05 The decision to permit Re-Listing via a simple F006 check or to require full F024 / F022 assessment, inspection and evaluation is to be taken by consideration of the following factors:

(a) whether the gyroplane or gyroplanes have been continuously in the custody and control of an ASRA member throughout the entire period;

(b) whether the gyroplane moved out of the custody and control of an ASRA member and has been in or through the hands of one or more unknown persons for much of the MIA period;

(c) whether the ASRA technical database contains enough detailed evidence and previous photos of the gyroplane to determine whether any structural or configuration changes have occurred in the meantime;

(d) if the technical information on the ASRA gyroplane database is insufficient to determine whether the gyroplane is in original condition, then a full F024 / F022 assessment and inspection should be specified; and

(e) if the evidence strongly suggests that substantial changes have been made to the gyroplane by an unknown person or unknown people since it was last in the hands of an ASRA member, then a full **40-hours** Flyoff period should also be specified.

PART 3

PROCEDURES

Maintenance,
Maintenance Authorisations,
& Gyroplane Periodic Inspections

Section 22

MAINTENANCE PRINCIPLES AND "SYSTEMS OF MAINTENANCE"

Maintenance

22.01. Section 3 of the Civil Aviation Act 1988 defines maintenance as:

> *'Maintenance means any task required to ensure, or that could affect, the continuing airworthiness of an aircraft or an aeronautical product, including any one or combination of overhaul, repair, inspection, replacement of an aeronautical product, modification or defect rectification.'*

22.02. CASA's 'Maintenance Gide for Owners/Operators', Section 2 reads:

'You are responsible for the continuing airworthiness of your aircraft. As the owner/operator, you are responsible for ensuring that the inspection and overhaul frequencies for your aircraft and all its components are not exceeded and that they are maintained in accordance with the most appropriate maintenance program. The overall principle is that 'the system of maintenance (or maintenance programs) must adequately provide for the continuing airworthiness of the aircraft.'

22.03. CASA describes that there 'are three basic types of maintenance programs:'

'**1. Manufacturer's maintenance program**'

'The manufacturer of your aircraft knows the most about it and produces information that is automatically accepted as approved data, such as the maintenance manual (MM), the illustrated parts catalogue (IPC) and service bulletins (SBs).'

'The maintenance manual will provide both a maintenance schedule and instructions on how to do the maintenance. This includes repairs, corrosion control and scheduled maintenance (e.g. every 100 hours / 12 months) and unscheduled maintenance tasks in response to incidents such as heavy landings, lightning strike or flight through heavy turbulence.'

'The maintenance manual might also contain an airworthiness limitations section, prescribing when an item such as an engine must be overhauled, or a set of rotor blades must be retired as scrap. The illustrated parts catalogue lists all the parts approved for installation in your aircraft. The service bulletins advise you about urgent or optional actions or modifications intended to enhance the safety of your aircraft.'

'All of the above are known as instructions for continued airworthiness (ICA).'

'**2. System of maintenance (SOM)**'

'This type of system consolidates all the different information required to provide for the continuing airworthiness of your aircraft. It combines the basic manufacturer's schedules and retirement lives found in the maintenance manual, applicable service bulletins etc. with specific requirements tailored to your operation.' **ASRA NOTE**: *CASA will initially approve the ASRA system of maintenance during CASR Part 149 transition, which in future may also involve ASRA being authorised to approve individual systems of maintenance.*

CASA continues: 'If you own a helicopter, you must follow either the manufacturer's maintenance program, or a CASA approved system of maintenance (SOM) and charter aeroplanes must follow the manufacturer's maintenance requirements or have an SOM. Irrespective of the maintenance schedule you elect to follow, the principle is the same: 'the system of maintenance must adequately provide for the continuing airworthiness of the aircraft.'

CASA continues: 'Private fixed-wing piston-powered aircraft (class B aircraft) have the option of using CASA Schedule 5.'

'**3. CASA Schedule 5**'

'The CASA Maintenance Schedule, which is in Schedule 5 of the Civil Aviation Regulations (CARs), is widely misunderstood. Many think it replaces or relaxes the manufacturer's maintenance schedule. However, the Civil Aviation Advisory Publication (CAAP) 42B-1 (0) (the CASA Maintenance Schedule) recommends studying manufacturers' schedules as they are generally more appropriate for the maintenance of individual aircraft.'

CASA added: ‘CASA Schedule 5 came into being many years ago to address a specific identified unsafe condition, where light airplanes imported into Australia had no manufacturer’s maintenance schedule or had an inadequate maintenance schedule.’

IMPORTANT ASRA NOTE:

PARTS 3 & 4 OF THIS TECHNICAL PROCEDURES MANUAL (TPM) FORM THE ASRA DEFAULT SYSTEM OF MAINTENANCE TO BE USED PARTICULARLY IN RELATION TO AMATEUR-CONSTRUCTION. FOR OWNERS OF COMMERCIALLY-MANUFACTURED GYROPLANES, ASRA REQUIRES OWNERS TO ADHERE TO THE MANUFACTURER’S SYSTEM OF MAINTENANCE.

Section 23

ASRAs MAINTENANCE PHILOSOPHY

23.01 ASRA's Maintenance philosophy and resulting policies are:

(1) **METHODICAL INSPECTION AND MAINTENANCE IS ESSENTIAL FOR THE SAFE ONGOING OPERATION OF ANY ROTORCRAFT.**

(2) **BUILDERS AND OWNERS OF ASRA-LISTED GYROPLANES ARE, AND ALWAYS REMAIN, 100% LEGALLY RESPONSIBLE FOR THE SAFETY OF THEIR ROTORCRAFT AND OF ITS OCCUPANTS.**

(3) **ASRA's GYROPLANE CONSTRUCTION STANDARDS HAVE BEEN PROGRESSIVELY DEVELOPED USING THE BEST AVAILABLE KNOWLEDGE AND ACCUMULATED OPERATIONAL EXPERIENCE, AND ASRA WILL NOT PREVENT A GYROPLANE THAT CONTINUALLY MEETS THE ASRA CONSTRUCTION STANDARDS FROM BEING FLOWN AT THE OWNER-PILOT'S OWN RISK PROVIDED MEMBERSHIP AND LISTING FEES ARE FULLY PAID UP.**

(4) **NEITHER ASRA NOR CASA FORMALLY GUARANTEES THE AIR-WORTHINESS OF ANY ASRA-LISTED GYROPLANE.**

(5) **ASRA IS ALWAYS MINDFUL THAT MANY ASRA MEMBERS LIVE IN REMOTE REGIONS AND THAT MOST ASRA MEMBERS CANNOT AFFORD FULL PROFESSIONAL MAINTENANCE FOR THEIR AIRCRAFT.**

(6) **ASRA HAS THEREFORE DEVELOPED ITS MAINTENANCE PROTOCOLS TO ENSURE, WHERE POSSIBLE, THAT THE OWNER-PILOT IS PERSONALLY RESPONSIBLE FOR THEIR OWN MAINTENANCE AND THAT 3rd-PARTY INVOLVEMENT IS KEPT TO A PRUDENT MINIMUM.**

Principle 1: The Owner-Pilot is 100% responsible for Maintenance.

Principle 2: This Owner-Pilot's responsibility means:

(a) provided they are the listed owner and hold an ASRA pilot certificate, they can do maintenance as detailed in the Maintenance Authorisation Table at Section 27 of this Manual *provided* they are skilled and capable of doing it, but must not do maintenance that is too complex for them (such as in-depth engine or electrical maintenance); and

(b) where the upcoming maintenance task is too complex, the owner MUST arrange 3rd party assistance, whether from a fellow ASRA member or TA or STA, or from a 3rd-party technician (whether aviation, electrical or automotive).

Section 24

COMPULSORY AND ELECTIVE PERIODIC MAINTENANCE

24.01 The Civil Aviation Safety Authority (CASA) places great emphasis on periodic maintenance.

24.02 CASA mandates a periodic maintenance scheme applicable to Class B aircraft, which are **all** aircraft other than those involved in Airline operations. Gyroplanes are therefore Class B aircraft.

24.03 CASA clearly sets out that the 'hierarchy' of maintenance processes for Australian aircraft is to be:

(a) **As the Manufacturer specifies (if commercially manufactured);**

(b) **if amateur-constructed, as the Builder / Rebuilder specifies; or**

(c) **if no current Manufacturer or Builder has or is specifying maintenance, then the default maintenance scheme is to be CAR Schedule 5 (soon to be replaced by CASR Part 43 Manual of Standards [MOS] Schedule 1)**

ASRA's implementation of the CASA requirements

24.04 CASA, within its CAR Schedule 5 and associated references, emphasizes:

(a) the importance of the **DAILY INSPECTION** and identifying who was responsible for it;

(b) that periodic maintenance must occur at intervals not greater than **12 months**;

(c) that Class B aircraft that are solely private aircraft must have an **Annual Inspection**;

(d) that Class B aircraft used for other purposes other than strictly private purposes also are required to have **100 hourly inspections**. Within general and recreational aviation, this is interpreted as applying to **AIRCRAFT USED FOR TRAINING**, and within the ASRA context as applying to gyroplanes used for **AERIAL MUSTERING**. This 100-hourly requirement is entirely logical, given that gyroplanes used in TRAINING or AERIAL MUSTERING are likely to be accumulating flying hours at much faster rates than aircraft used solely for private purposes.

ASRA's **COMPULSORY** periodic maintenance

24.05 After taking into consideration the legal situation applying to ASRA following the removal of CAO Exemptions and replacement with CASR Parts 103 and 149, **as from 1 January 2024** the following COMPULSORY periodic maintenance processes will apply"

(a) For ALL ASRA Gyroplanes – certified **DAILY INSPECTIONS** in accordance with the manufacturer's requirements; or, required for every day the aircraft is removed from a hangar / shed and used for airborne operations;

(b) (b) For ALL ASRA Gyroplanes – an **ANNUAL INSPECTION** in accordance with the manufacturer's requirements, aligned into the Membership and Listing Renewal 12-calendar-month Cycle;

(c) For ALL ASRA Gyroplanes used for **TRAINING** or **AERIAL MUSTERING**,100 hourly inspections.

ASRA's **ELECTIVE** periodic maintenance

24.06 ASRA also takes the view that a comprehensive voluntary periodic maintenance scheme for any gyroplane ***IS HIGHLY DESIRABLE AND SHOULD ADDITIONALLY INVOLVE***:

(a) engine, airframe, or gyroplane component manufacturer's urgent supplementary inspection or maintenance requirement;

(b) 25-hours inspections (for brand-new aircraft only);

(c) 50-hourly inspections (where generally oil and oil filters are replaced); and

(d) 100-hourly inspections (where things like spark plugs are checked and possibly replaced and v-belts closely examined, etc.)

Section 25

MAINTENANCE MANAGEMENT OF ASRA ULTRALIGHT & LSA GYROPLANES

ALL ASRA-LISTED GYROPLANES

Column 1 GYROPLANES PRODUCED BY CURRENT COMMERCIAL MANUFACTURERS	Column 2 AMATEUR-CONSTRUCTED OR BUILT-TO-ORDER; OR ACCIDENT-REBUILD HYBRIDS; OR GYROS PREVIOUSLY PRODUCED BY OUT-OF-BUSINESS MANUFACTURERS (KNOWN AS "ORPHANS")
Gyroplanes manufactured by a currently operating commercial manufacturer within Australia or overseas and imported either fully assembled or as kits by an agent or representative. _____ **Construction Standards –** **ASRA Construction Standards** _____ **SYSTEM OF MAINTENANCE –** **"AS THE MANUFACTURER SPECIFIES"** **(Insert "MANUFACTURER'S" in F007)** **PLUS** **Ongoing compliance with the relevant ASRA Construction Standard** **PLUS** **Compliance with ASRA Directives and Alerts.**	Home-built or Built-to-Order gyroplanes using new or used components sourced domestically or from overseas suppliers, as well as older imported gyros whose manufacturer is out of business (orphans) plus hybrid accident rebuilds. _____ **Construction Standards –** **ASRA Construction Standards** _____ **SYSTEM OF MAINTENANCE –** **"THE ASRA SYSTEM OF MAINTENANCE"** **(Insert "ASRA's S.O.M." in F007 and Database Screen -see page 47)** **PLUS** **"Any additional requirement that the builder or component manufacturer has specified"** **PLUS** **Ongoing compliance with the relevant ASRA Construction Standard** **PLUS** **Compliance with ASRA Directives and Alerts.**

Section 26

REVIEW SUMMARY - "SYSTEMS OF MAINTENANCE"

26.01 Throughout 2023, as ASRA transitions to operations under CASR Part 103 and 149, and away from Exemptions, ASRA's electronic database and paperwork is being adjusted to better conform to CASA Regulatory requirements.

26.02 One important CASA requirement is that aircraft owners are required to specify a "system of maintenance" that they use on their respective aircraft.

"Systems of Maintenance" for commercially-manufactured gyroplanes

26.03 Owners of commercially-manufactured gyroplanes have a fairly straightforward situation because their gyroplanes are supplied with a Manufacturer's Flight Manual, and many manufacturers also maintain comprehensive Maintenance Manuals and Service Directives on the websites.

26.04 Therefore, whenever a commercially-manufactured gyroplane owner is called on to specify the "system of maintenance" they use, all the owner needs to do is write:

"as the Manufacturer specifies"

"Systems of Maintenance" relevant to amateur-constructed gyroplanes OR post-major-accident-damage Rebuilders of gyroplanes OR Rebuilders of Hybridized gyroplanes heavily modified from airframes originally built by manufacturers that have gone out of business.

26.05 Those owning these several classes of gyroplanes have a more complex situation, because it is likely that any Manufacturer's Flight Manual, if it ever existed, is likely to be obsolete and irrelevant because the rebuilding process of a damaged or salvaged gyroplane usually involves substantial changes. In any event, CASA regulations specify that once a manufacturer goes out of business, that a description of "*as the manufacturer specifies*" is no longer adequate.

26.06 Therefore, the Original-amateur-constructor or the any subsequent post-major-accident-damage Rebuilder, or any Rebuilder of an out-of-production Hybridized gyroplane, needs to make a choice about what system of maintenance they will specify. There are several alternatives that might be used:

(1) **"*the Amateur-constructor's system of maintenance"; or***

(2) **"*the Builder's or Rebuilder's system of maintenance*"; or**

(3) **"*the ASRA System of Maintenance*"**

26.07 Alternatives (1) or (2) require the amateur-constructor or Rebuilder to sit down and write a complete Flight Manual, plus Maintenance Schedules.

26.08 Alternative (3), however, will be an attractive option for most Amateur-constructors or Rebuilders because the ASRA sample Flight Manual is available on the ASRA website for downloading, and the ASRA Maintenance Schedules are contained in this TPM.

Section 27 ASRA MAINTENANCE AUTHORISATIONS

MEMBER STATUS	DAILY INSPECTION (**ALL GYROS**)	Pre & Post-Flight INSPECTION (**ALL GYROS**)	50 hourly INSPECTION (**ELECTIVE**)	100 hourly INSPECTION (**TRAINERS**)	**ANNUAL INSPECTION** (**ALL GYROs**)	200/500 hourly INSPECTION & beyond (**TRAINERS**)
STUDENT Pilot Certificate Holder **(NON-OWNER)**	**NO***	**YES**	**NO***	**NO***	**NO***	**NO***
FULL Pilot Certificate Holder **(NON-OWNER)**	**YES**	**YES**	**NO***	**NO***	**NO***	**NO***
ORIGINAL AMATEUR-BUILDER OWNER	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
MAJOR-DAMAGE REBUILDER OWNER	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
ASRA TECHNICAL ADVISER	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
ASRA SENIOR TECHNICAL ADVISER	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
2nd-HAND HOMEBUILT OWNER	**YES**	**YES**	**YES****	**YES****	**YES****	**YES****
NEW COMMERCIALLY MANUFACTURED GYRO OWNER	**YES**	**YES**	**YES****	**YES****	**YES****	**YES****
OWNER OF 2nd-HAND COMMERCIALLY MANUFACTURED GYRO	**YES**	**YES**	**YES****	**YES****	**YES****	**YES****

YES = IF they have the skill and experience to do the task + IF the Importer allows them (for commercially-manufactured Gyros)**

NO* = Means the Holder can't certify for these tasks BUT they can ASSIST the Owner.

Section 28

ASRA's 3rd-PARTY MAINTENANCE INSPECTION REQUIREMENTS

Policy

28.01 ASRA has a widely dispersed membership with about half the membership living in relatively isolated rural areas or remote Outback regions.

28.02 ASRA gyroplanes are most usually operated from station or farm properties, farm strips, private strips or much less commonly from public access licensed aerodromes. And, because of the low-and-slow character of gyroplanes and their normally limited fuel capacities, ASRA members do not usually fly their aircraft to maintenance facilities in the way airplane owners often do.

28.03 These facts result in a strong tradition of INDEPENDENT OWNER MAINTENANCE within ASRA, and history has shown that during the period of operating under Exemptions, particularly in the period 2000 to 2022, maintenance and inspection-related accident and incident rates have been extremely low.

Amateur-Construction or Homebuilding Inspections

28.04 ASRA no longer maintains a formal requirement for stage inspections while an amateur-constructed gyroplane is being built. This is because gyroplane frames and components are usually relatively simple and straightforward and remain accessible and visible throughout the operational life of the machine, in contrast to home-built airplanes where vital structures (such as wings) need to be "closed out" during construction.

28.05 Despite having no stage inspections during home-building a gyro, informal collaboration between members and involvement of TAs in any home-building project is strongly encouraged. There is a wealth of construction knowledge and experience within ASRA membership ranks, and amateur constructors are very strongly encouraged to "tap into" that resource.

ASRA's Policy on independent 3rd-party inspections

28.06 ASRA recognizes, however, that within the wider aviation community, a very strong emphasis on 3rd party inspection and maintenance exists, driven primarily by the fact that VH-registered aircraft often operate within controlled airspace, over towns and cities, at night and in IFR conditions.

28.07 ASRA also recognizes that 3rd-party inspections are especially important in the overall maintenance management of gyroplanes, where periodic close examinations of gyroplanes by independent 3rd-parties will often reveal issues that need to be fixed that owners have overlooked.

28.08 ASRA has therefore evolved what it considers a sensible compromise arrangement between independent owner maintenance and the desirability of periodic independent 3rd-party maintenance involvement.

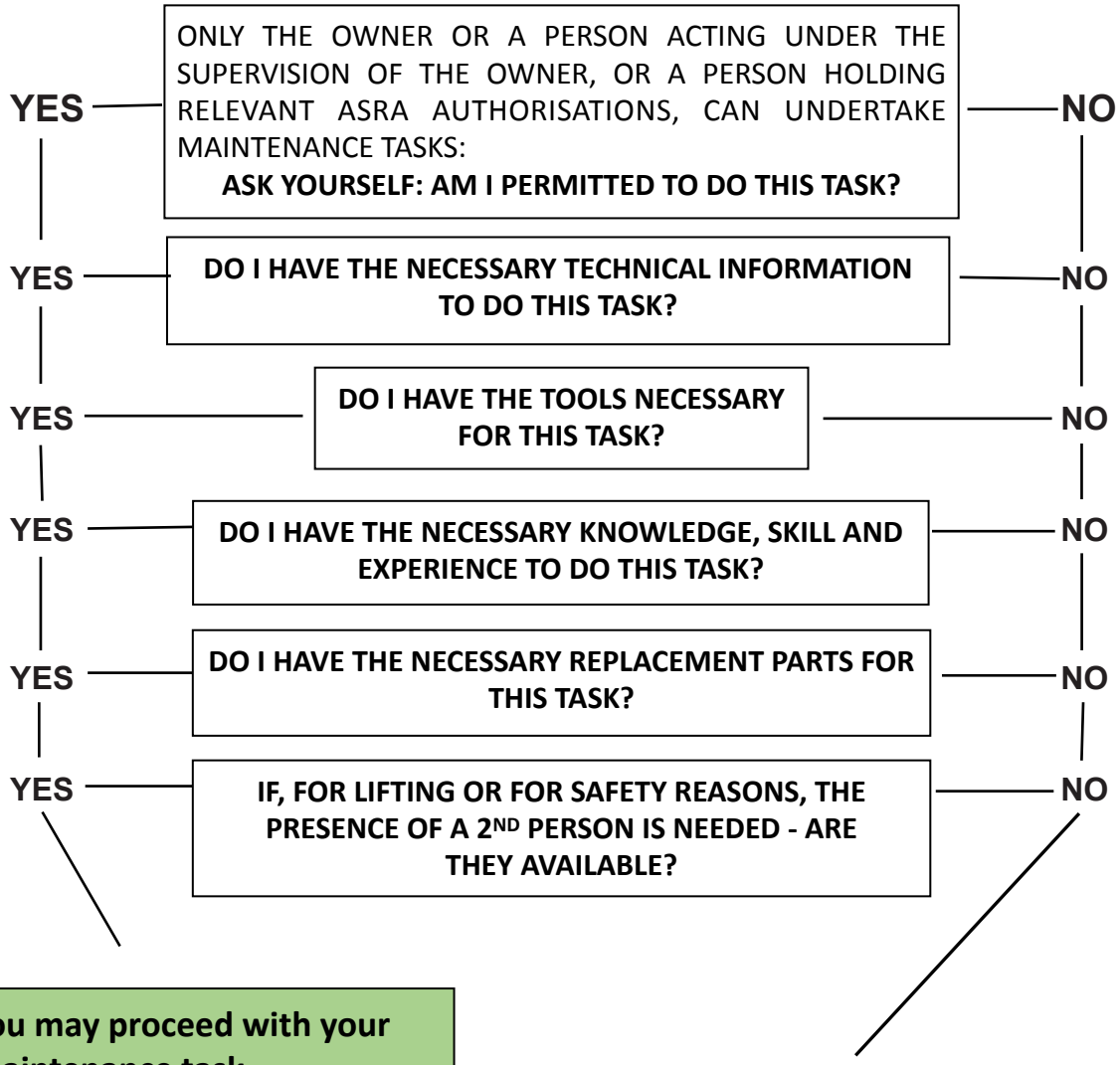
ASRA's MANDATORY 3RD- PARTY INSPECTION REQUIREMENTS

As detailed in Section 12, five T.A. Inspections are MANDATORY –

1. **A PRE-INITIAL ACCEPTANCE AND LISTING INSPECTION OF ANY NEW GYRO (AMATEUR-BUILT OR COMMERCIALLY MANUFACTURED);**
2. **A "FIRST OF TYPE" PRE-INITIAL ACCEPTANCE AND LISTING INSPECTION OF ANY SERIAL-PRODUCED IMPORTED OR DOMESTICALLY MANUFACTURED GYROS;**
3. **POST-PURCHASE INSPECTION OF ANY 2ND HAND-GYRO;**
4. **POST-MAJOR MODIFICATION INSPECTION OF ANY GYRO; AND**
5. **POST-MAJOR DAMAGE REPAIR OR REBUILD OF ANY GYRO.**

Section 29

Making the decision to do maintenance by yourself or to arrange or involve assistance



STOP – DON'T ATTEMPT THE TASK, UNTIL:

(1) YOU HAVE ARRANGED FOR APPROPRIATE SKILLED ASSISTANCE, SUCH AS:

(i) A Rotax-qualified engine technician, if needed;

(ii) A Subaru-qualified engine technician, if needed (can be automotive)

(iii) A highly skilled welder (preferably aircraft qualified, but highly skilled automotive could be suitable);

(iv) A skilled automotive or aviation electrician, or radio technician, if needed; or

(v) A fellow ASRA member skilled in the maintenance process to be undertaken or a TA or STA or, (some people's preference) a LAME or AME if available.

ATTEMPTING THE TASK WITHOUT APPROPRIATE ASSISTANCE CAN EASILY RESULT IN EXPENSIVE MISTAKES

Section 30

ASRA's MAINTENANCE-RELATED DOCUMENTATION

The Key ASRA Maintenance-Related Documents.

30.01 ASRA's Key Maintenance Documentation includes:

(a) The **Gyroplane Flight Manual** – May contain the Manufacturer's System of Maintenance (SOM) requirements

(b) The **Gyroplane Logbook** – contains a permanent record of airframe and engine hours, as well as brief detail of all periodic inspections undertaken and of all modifications and repairs undertaken

(c) The personal **Pilot Logbook** – usually contains entries that help build a comprehensive maintenance picture, such as where and when breakdowns or technically-related incidents occur

(d) ASRA's F007 **Release to Service** document – This document establishes the person who has ultimate maintenance responsibility for the gyroplane, and contains sections for brief descriptions of any urgent unscheduled maintenance undertaken as well as for all periodic inspections

(e) ASRA's F008 **Daily Inspection Certifications and Aircraft time-in-Service Sheet for Release to Service Records** document – this document always remains with the F007 and identifies the person who performed the Daily Inspection, as well as containing sections for entering names of pilot-in commend as well as any 2nd occupant, airframe elapsed "out" and "in" times, flight duration, brief details of the trip or flight sequences undertaken, and the number of landings

(f) ASRA's F005 **Gyroplane Component Transfer Declaration** – this document can be requested by the buyer or transferee of a Gyroplane Component and provides an extremely important "documentary bridge" or link between the maintenance records of the transferor / seller and of the transferee / buyer.

IT IS A STRICT CONDITION OF ASRA MEMBERSHIP THAT IF A TRANSFEREE OR BUYER REQUESTS A FORM F005 FOR A GYROPLANE COMPONENT THAT THE TRANSFEROR OR SELLER MUST PROVIDE IT.

Documentation that must be carried during flight

30.02 The following documentation MUST be carried during any Gyroplane Flight:

(a) **THE GYROPLANE FLIGHT MANUAL**

(I) if the gyroplane is Provisionally Listed, those parts of the Flight Manual that are complete need to be carried; and

(II) If the gyroplane is Fully Listed, the full gyroplane Flight Manual must be carried.

(b) **THE ASRA F007 RELEASE TO SERVICE DOCUMENT**; and

(c) **THE ASRA F008 INSPECTION CERTIFICATIONS AND AIRCRAFT TIME IN SERVICE SHEET FOR RELEASE TO SERVICE RECORDS**.

30.03 The reason why these documents MUST be carried during any gyroplane flight is that they provide ***valuable recent operational information***, the identities of persons flying, or flying in the aircraft, the types of flying activities undertaken, the increasing Total Time in Service of the airframe, the number of landings, any urgent or unscheduled maintenance or repairs undertaken, and the periodic maintenance tasks undertaken.

30.04 The requirement that 1 x F007 Release to Service sheet, and 2 x Daily Inspection Certifications sheets are carried are:

(a) the F007 Release to Service is the ASRA equivalent to the outgoing CASA Maintenance Release (soon to be also called Release to Service), which MUST be carried on all Australian aircraft as a strict legal requirement; and

(b) the F008 Daily Inspection Certification sheets (2 copies). CASA regards Daily Inspection Certification as one of the most important maintenance recording processes for any Australian aircraft, with gyroplanes no longer being exempted from this requirement.

The information progressively built up on the F008 sheets provides a valuable picture of the gyroplane's recent activity, and also acts as an evidentiary "bridge" between the VDO / HR MTR readings and the eventual elaborating entries in the pilot's Personal Logbook and the Gyroplane Logbook.

IT IS A STRICT CONDITION OF ASRA MEMBERSHIP THAT THE FLIGHT MANUAL, THE ASRA F007 RELEASE TO SERVICE, AND THE ASRA F008 DAILY INSPECTION CERTIFICATIONS AND AIRCRAFT TIME IN SERVICE SHEET FOR RELEASE TO SERVICE RECORDS BE PRODUCED TO ANY CASA OFFICIAL UPON DEMAND.

Documentation that ASRA **DISCOURAGES** being carried during flight.

30.05 ASRA **strongly discourages** the carriage while airborne of:

(a) the **Pilot's Personal Logbook**; and

(b) the **Gyroplane Logbook**.

30.06 The **REASON** for this discouragement is because of the likelihood that those key documents will be lost or destroyed if a catastrophic accident occurs during flight.

30.07 ASRA much prefers and strongly recommends that the Pilot's Personal Logbook and the Gyroplane logbook either be kept safely at home, or in the case of Instructor, in their flight school office.

30.08 CASA's usual practice during "ramp checks" is that if they decide that they want to also review the pilot's personal logbook or the aircraft logbook, then they will normally give the aviator undergoing a ramp check to time produce the documents at a CASA office usually between 14 to 28 days later.

What to do if a 50-hourly or 100-hourly Inspection falls due over the same period an Annual Inspection is required

30.09 If a 50-hourly or 100-hourly inspection falls due within the 1 November to 14 December ASRA Annual Inspection Period, the 50-hourly or 100-hourly is SUBSUMED into the Annual Inspection.

NOTE CAREFULLY: 50-hourly and 100-hourly inspections have items that the Annual Inspection does not have, and vice versa. In other words, the full checklist for each type of inspection will need to be checked off if 2 types of inspection are being done at the same time.

30.10. An appropriate entry showing that the elective 50-hourly or elective 100-hourly (for solely private gyroplanes) or elective 50-hourly and compulsory 100-hourly (for gyroplanes also used for TRAINING, DFs or TIFs) must be made into the ASRA F007 Release to Service document as well as into the Gyroplane Logbook.

Section 31

USING ASRA's FORM F007 (RELEASE TO SERVICE) AND FORM F008 (ASRA DAILY INSPECTION CERTIFICATIONS & AIRCRAFT TIME IN SERVICE) SHEETS

The F007

31.01 **Print out a sample F007 sheet**. This sheet is based on the CASA Maintenance Release, universally used in general aviation for more than 70 years (in various forms). The CASA Maintenance Release will, from late 2023 or early 2024, be superseded by a 'Release to Service' document.

31.02 The ASRA Release to Service document has been introduced to establish a **STANDARDIZED** document for all ASRA gyroplanes, in a form that will be instantly recognizable to all civil aviators, and to CASA officials.

31.03 This ASRA Release to Service, intended to be carried on board a gyro during all airborne operations, contains key items of information, such as:

(a) the identity of the person who is responsible for the gyro maintenance (in ASRA's case, this is always the owner);

(b) the Owner's ASRA number and the Gyro's Listed number;

(c) whether the gyro is used solely in private operations or whether it is also used for training;

(d) what the gyroplane total Time in Service (TTIS) was as at the preceding first of January in the current year;

(e) the date on which the previous Annual Inspection was done, a date inserted by the Owner (who was responsible for the Annual Inspection); and

(f) any urgent or unscheduled maintenance done, as well as any period maintenance done.

THE F007 'RLEASE TO SERVICE' DOCUMENT IS TO BE SIGNED ONCE THE ANNUAL INSPECTION IS COMPLETED SUCCESSFULLY

31.04 The ASRA **Annual Inspection** is concluded by the Owner creating a fresh ASRA Form F007, 'Release to Service'.

31.05. The F007 'Release to Service' is **valid for 12 months**, or more precisely, to 11.59pm on the day before the anniversary of the completion of the Annual Inspection occurs the following year.

WHEN DOES ASRA REQUIRE THE ANNUAL INSPECTION TO BE DONE?

31.06 ASRA suggests that Owners should ideally conduct their **ANNUAL INSPECTION** in the period just before the ASRA membership renewal and gyroplane Listing renewal cycle begins. ASRA memberships and Listing cycles run on a CALENDAR YEAR basis – i.e. from 1 January to 31 December in any given year.

31.07 **Please also note that the ASRA electronic database will not accept Listing Renewal payments until 1 November each year, and that from 1 November 2023 the Listing Renewal database will require submission of the gyro Annual Inspection (as set out on page 47 of this Manual. Proper and accurate inputting of that Annual Inspection information will then result in the "payment" button becoming active, and payment for the gyro Listing Renewal can then be made.**

What if I have bought, or sold, a gyro during the year?

31.08 The Release to Service document is valid for the full twelve months from:

(a) the date the Owner of a new gyro affixes the plastic Listing Placard on the mast of his or her **NEW** gyroplane, which immediately thereafter the new Owner creates their first Form F007 'Release to Service' for that gyro; OR

(b) in the case of a sale / purchase / transfer, immediately when a TA has signed an F006 Transfer (**which is the time the new Owner is to create and sign their own F007, transferring the date of the previous Owner's Annual Inspection from their F007 into the new Owner's F007**); and

(c) the F007 created by the previous Owner then **ceases to be valid** at the point in time where the seller relinquishes custody and control of the gyro to the new Owner, which may be:

(I) when the seller physically hands the gyro over to the buyer; or

(II) when a pilot authorized by the seller to undertake a ferry flight to a location specified by the buyer completes that ferry flight; or

(III) when a road-transport operator picks up the gyro from the seller for road transport to the buyer's location.

TTIS Entries to be inserted into the F007.

31.07 The TTIS box on the top right of the F007 is intended to record TTIS figures for the start of each Calendar year (ie. 1 January). If the gyro has been sold or bought during a calendar year, any the purchasing owner will insert the TTIS figure from the seller's F007 when he or she is creating their fresh F007.

The nominated Scheme of Maintenance

31.08 CASA requires that all Owners SPECIFY a nominated Scheme of Maintenance for their aircraft. In ASRA's case, the schemes will be:

(a) "AS THE MANUFACTURER SPECIFIES" (see **Section 25.04**): OR

(b) "ASRA SYSTEM OF MAINTENANCE" (or other alternatives - see **Section 25.06**).

31.09 The Manufacturer's Scheme of Maintenance can be readily identified as being those processes incorporated into the Manufacturer's Flight Manual, as well as those contained in the Manufacturer's Maintenance Manuals (if any) as well as engine Manufacturer's manuals (such as Rotax Maintenance Manuals) as well as Manufacturer's Directives plus any ongoing requirements within the relevant ASRA Gyroplane Construction Standards and ASRA Safety Directives.

31.10 The ASRA Scheme of Maintenance can be readily identified as being those processes incorporated into Section 35 of this TPM, as well as those processes specified in the individual gyroplane Flight Manual lodged in the ASRA database, together with any ongoing requirements within the relevant ASRA Gyroplane Construction Standards and ASRA Safety Directives.

A Sample F007 is set out on the next page.

AUSTRALIAN SPORT ROTORCRAFT ASSOCIATION INCORPORATED

Release to Service _____

ASRA Form F007 YEAR

Cert No 00106

Validity period is from Annual Inspection +12 months. If sold, the expiry date on this is transferred to new F007

Rotorcraft Type:	Listed Number:	TTIS 01 JAN: _____ HRS
Name of Owner:	ASRA Member Number:	Usage: Recreational ☐ Plus Training ☐ Plus Mustering ☐

WARNING: This document is only valid if the current proof of Annual Listing Placard is affixed to the mast.

DECLARATIONS: (1) The Maintenance System for this Gyro is: _____

(2) Annual Inspection completed on: (exact date & place) _____

This Release to Service is VALID for 12 months from the date of Annual Inspection.

Signature of Owner: _____ **Date of Signature:** _____

Item No.	Urgent and/or Periodic Maintenance done (brief description)	Signature for completion	Date of completion

FOLD LINE

Continuation of urgent and/or periodic maintenance done

Item No.	Urgent and/or Periodic Maintenance done (brief description)	Signature for completion	Date of completion

This Release to Service must be carried on board any ASRA Rotorcraft during airborne operations and must be produced by the owner or operator to any CASA official upon request (i.e. during Ramp Checks, etc).

The owner is the only person allowed to insert signatures into this document with the sole exception of any CASA Licensed LAME who they have *optionally* engaged to maintain their aircraft, whether that LAME is an ASRA Senior Technical Adviser OR a completely independent LAME.

USING THE F008 'ASRA DAILY INSPECTION AND AIRCRAFT TIME IN SERVICE SHEET

The F008

30.13 **Print out a sample F008 sheet**. This type of sheet will be instantly recognisable to ASRA members with previous civil aviation experience and is printed out at the same time as the F007.

30.14 As stated earlier, this Form is intended to capture up-to-the-minute information about who did the Daily Inspection on any day the gyroplane was used, as well as recording who was pilot-in-command (PIC) and who, if any, passengers, or students were carried.

30.15. The 'VDO or HR MTR' boxes are self-explanatory, as is the 'Duration' row (in minus out = duration).

30.16. The 'Trip" or 'Training Sequences' rows have enough space for abbreviated place names or training sequence descriptors. If the writer wants to insert more information into the 'Trip' row, there is no problem with going into a second row – just make sure any subsequent day's entries on the left-hand side of the page are started on the line below where the trip descriptions on the right-hand side ends.

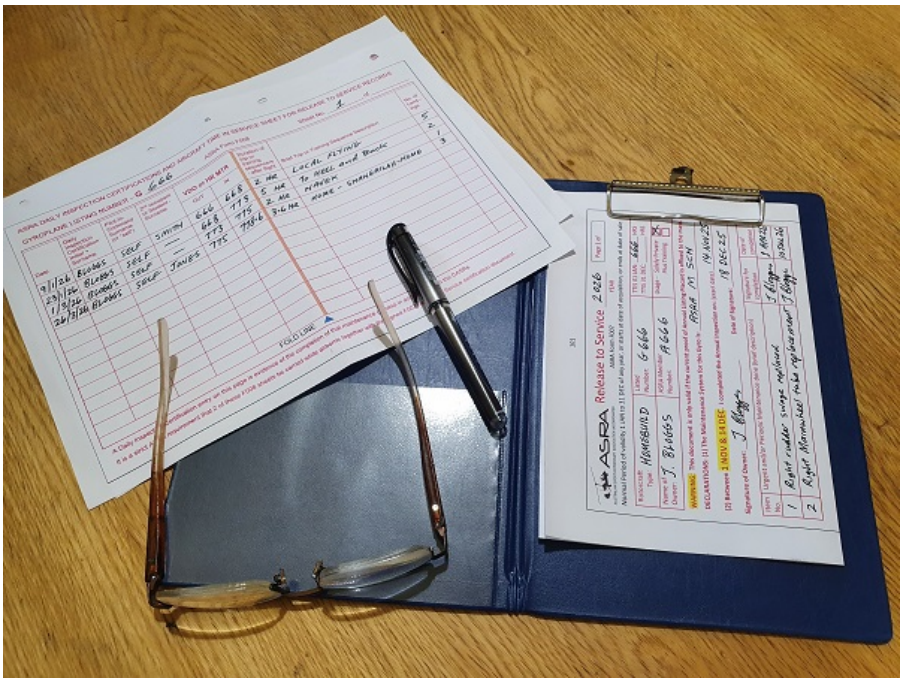
Why two (2) F008 Sheets are to be carried.

30.17 There is every likelihood that the F008 sheet will be used much more frequently than the F007 sheet, or in other words the rows are likely to fill up much faster than on an F007. The reason why a blank 2nd sheet must be carried is that when the current sheet is filled-up, that current sheet is placed behind the fresh F008 sheet and the process of filling that fresh sheet continues.

30.16 Having the earlier fully completed sheet immediately under the current "in-progress" sheet allows people (such as a CASA official) to review the gyroplane's recent operations.

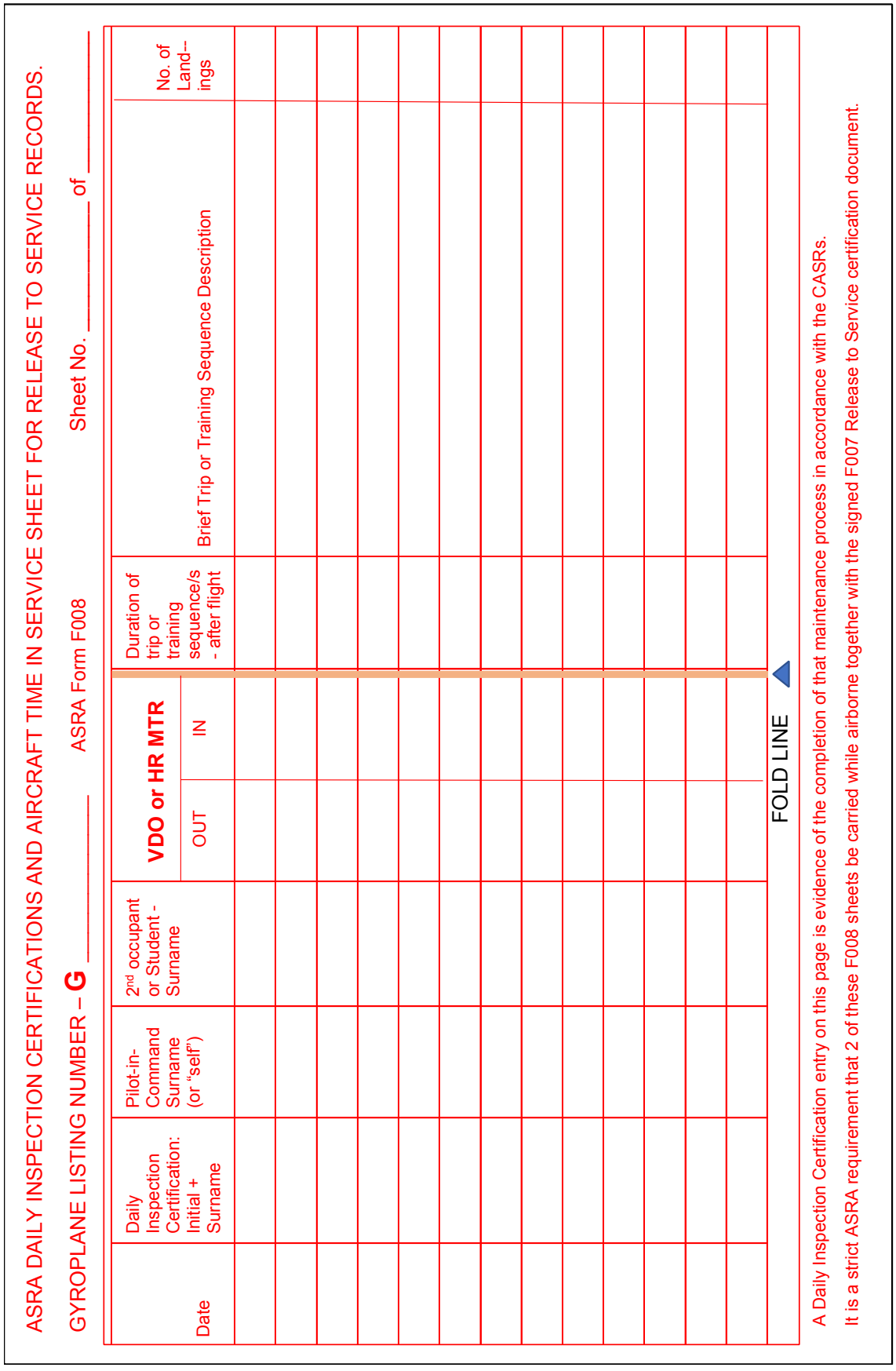
How to store the F007 and F008 in the gyroplane

30.17 People with civil aviation experience will immediately recognize that the usual practice for carrying such on-board documentation is in a small folder (usually B5 size) because it can be easily stored in door or seat pockets. See picture below:



REMEMBER: FULL AND MATCHING PERSONAL LOGBOOK AND GYRO LOGBOOK ENTRIES MUST ALSO ALWAYS BE MADE.

Sample F008



ASRA DAILY INSPECTION CERTIFICATIONS AND AIRCRAFT TIME IN SERVICE SHEET FOR RELEASE TO SERVICE RECORDS.

GYROPLANE LISTING NUMBER – **G** _____ ASRA Form F008 Sheet No. _____ of _____

Date	Daily Inspection Certification: Initial + Surname	Pilot-in-Command Surname (or "self")	2nd occupant or Student - Surname	VDO or HR MTR OUT	VDO or HR MTR IN	Duration of trip or training sequence/s - after flight	Brief Trip or Training Sequence Description	No. of Land--ings

FOLD LINE

A Daily Inspection Certification entry on this page is evidence of the completion of that maintenance process in accordance with the CASRs.

It is a strict ASRA requirement that 2 of these F008 sheets be carried while airborne together with the signed F007 Release to Service certification document.

Section 32

MONITORING GYROPLANE COMPONENT TOTAL-TIMES-IN-SERVICE ("TTIS")

Three components to record-keep

32.01 All rotorcraft, including gyroplanes, are sometimes irreverently called *"… a loose formation of spare parts thrashing their way through the air."*

32.02 There are three (3) types of components where TTIS needs to be monitored closely. They are:

(a) **the Gyro Airframe**;

(b) **the Gyro Rotor Assembly**; and

(c) **the Engine**.

The Gyroplane Airframe

32.03 A gyroplane airframe usually comprises a central keel beam one which is mounted a near-vertical "mast" as well as an undercarriage arrangement. Components such as engines and propellers, fuel tanks or seat tanks, fuselage "pods", and tail surface are then attached.

32.04 The airframe is not actually a "timed component", but for ASRA administrative and record-keeping purposes, ASRA treats the airframe as the primary structure, because it is onto, or into this frame that all other components are installed or fitted.

32.05 Importantly, one component that is installed in a gyro from the outset is a **VDO or Hour Meter**.

32.06 ASRA uses that **VDO or Hour Meter** as the PRIMARY time-in-service reference for the entire life of the gyroplane. VDOs or Hour Meters are wired so that they become active when the engine ignition circuit is active. The VDO or Hour Meter originally fitted to the gyroplane when new is expected to remain in that frame for the full operational life of the gyroplane.

Installation of newer Rotor Systems well into the operational life of a gyroplane

32.07 It is quite commonplace during the operational life of a gyroplane airframe that new rotor assemblies will be fitted, usually because life-limited rotors have reached "retirement age".

32.08 Whenever a rotor assembly changeover of this kind occurs, a prominent entry is to be made in the Gyroplane Logbook that a zero-timed rotor assembly has been fitted to the airframe, and the total-time-in-service of that airframe at time of fitment is to carefully noted. From that point onward, the time-in-service of the rotor assembly will be calculated by taking the total accumulated time-in service of the gyroplane from the VDO or Hour Meter, then deducting the airframe total-time-in-service as at the time of the retrofitting of the new rotor assembly. The resulting number will be the new rotor assembly's time in service.

Installation of newer engines well into the Operational life of a gyroplane.

32.09 It is not unusual for a newer engine to be retrofitted to a gyroplane airframe during its operational life. Rotax 4-stoke engines usefully contain ignition modules that allow the total-time-in-service to be established by a download. Subaru engines are more difficult to "age" definitively because they don't have internal time logs. In any event, using a similar manner to that used for fitting newer rotor assemblies, either a zero-time Rotax or a zero-timed overhauled Subaru can be fitted, and a very careful and prominent note of that fact entered into the gyroplane logbook. Using that entry as a guide, the separate accumulating time-in-service can then be calculated at any later time by comparison to the TTIS at time of fitment of the engine.

Section 33

GYROPLANE ENGINES

Engine configurations

33.01 Gyroplane engines are either four-stroke or two-stroke petrol engines. CASR Part 103 specifically prohibits the installation of turbine engines into ultralight aircraft.

33.02 Petrol engines can then be further classified into being either dedicated aircraft engines (such as Rotax engines) or automotive engine conversions, such as Subaru boxer engines.

Rotax engines

33.03 Rotax is an Austrian company, now part of the Bombardier Group.

33.04 Rotax two-stroke engines include:

(a) Rotax 503 – 50hp (no longer manufactured)

(b) Rotax 582 – 65hp (in continuing production)

(c) Rotax 618 – 73.8hp (no longer in production)

33.05 Rotax four-stroke engine include:

(a) Rotax 912 A/F/UL 80hp (in continuing production)

(b) Rotax 912 S/ULS 100hp (in current production)

(c) Rotax 912 iS Sport 100hp (fuel injected) (in current production)

(d) Rotax 914 F/UL 115hp (turbo) (in current production)

(e) Rotax 915 iS 141hp (fuel injected + turbo) (in current production)

33.06 Rotax 4-stroke engines have particular advantages for ultralight owners who also hold CASA pilot licences, because the 912/4/5 series and derivatives are approved engines able to be used on ultralight aircraft entering Class D airspace at secondary airports. In addition, Rotax 4-stroke engines are manufactured to the ASTM Standard and Type Certified examples are available (which may be relevant to LSA Gyroplanes and their use by CASA flight crew licence holders).

Subaru boxer Automotive conversions

33.07 Subaru four-cylinder four-stroke boxer configuration engines used on many Australian gyroplanes include:

(a) Subaru EA 81 – 73hp (no longer manufactured)

(b) Subaru EJ 20 – 115hp (no longer in production)

(c) Subaru EJ 22 – 135hp (no longer in production)

(d) Subaru EJ 25 – 165hp (1995 and still in current production)

33.08 Because the EA and EJ series engines are automotive, enormous numbers of them were produced and still exist. A thriving aftermarket also exists where endless combinations of turbocharging, fuel injection and performance engineering can easily take EJ 22s and EJ 25s up to 180hp and beyond at relatively modest prices.

33.09 Modern automotive conversions universally operate using electronic ECMs (engine control modules) which provide excellent “tuneability” and performance diagnostics. Owners of automotive conversions MUST ensure, however, that any “limp home” programming in automotive conversions is permanently disabled. Experience shows that gyro engines that experience “limp home” activation are incapable of sustaining level flight. **NOTE CAREFULLY: CONVERTED AUTOMOTIVE ENGINES WILL NOT BE ACCEPTED FOR PART 103 LSA AIRCRAFT.**

AS WITH ALL OTHER GYROPLANE COMPONENTS, THE OWNER TAKES 100% RESPONSIBILITY AND LEGAL LIABILITY FOR THE ENGINE FITTED INTO THEIR GYROPLANE. ROTAX 4-STROKE OWNERS ARE STRONGLY ENCOURAGED TO USE THE SERVICE OF ROTAX APPROVED SERVICING TECHNICIANS. WHILE OWNERS OF SUBARU ENGINES ARE STRONGLY ENCOURAGED TO UTILIZE THE SERVICES OF SPECIALIST SUBARU AUTOMOTIVE TECHNICIANS.

Section 34

ASRA FORM F005 – GYROPLANE COMPONENT TRANSFER DECLARATION

34.01 The ASRA Form F005 has been available to members for over 7 years, but with the repeal of CASAs Exemptions and the transition to operations under CASR Parts 103 and 149, the importance of having auditable and traceable maintenance records has become especially important.

34.02 The Form F005 is titled 'Gyroplane Component Transfer Declaration' and is designed to provide a permanent record in the hands of the buyer of a gyroplane component of the previous history of the component they bought from another member.

34.03 As from 1 January 2024 **IT WILL BE A STRICT CONDITION OF ASRA MEMBERSHIP** that a member selling any of the components listed on the F005 'Type of Gyroplane Component' section is to provide an F005 completed to the best of their knowledge **IF THE BUYER REQUESTS IT**.

34.04 Any F005 obtained by a buyer from a seller is to be retained by the buyer to form part of the Gyroplane Logbook of the machine into which the component was installed.

34.05 This process will form an important bridge or link between the Gyroplane logbooks of the seller and those of the buyer, thus creating an auditable chain of information.

A sample ASRA Form F005 is set out on the next page

Australian Sport Rotorcraft Association Incorporated

F005 GYROPLANE COMPONENT TRANSFER DECLARATION

(Not required for brand new components provided by the original seller)

ABN 53 412 417 012

Name of current owner (Transferor or Seller):

Address of current owner (Transferor or Seller):

Contact phone number(s) and email (Transferor or Seller):

TYPE OF GYROPLANE COMPONENT

☐ Set of rotor blades ☐ Hub Bar ☐ Rotor hub Assembly (complete or partial)
☐ Torque tube assembly ☐ Horizontal / Vertical Control Rods ☐ Control stick
☐ Propeller (complete) ☐ Engine (complete) ☐ Propeller re-drive or gearbox (complete)

If component not described in the list above, please describe it here:

Manufacturer: Serial Number:

Number of hours on component when seller originally obtained it:

Number of hours seller has run up on the component:

Seller: I have owned the component for:

Seller: I originally got the component from:

Seller: The history of the component while I have owned it is:

Accidents / Incidents (Seller) The component in my hands or the hands of the previous owners(s) has been involved in the following incidents / accidents and has been repaired / not repaired as follows:

I certify that all the information detailed above is true and correct

Signature of Component Seller

Date:

Section 35

THE ASRA DEFAULT MAINTENANCE SCHEDULE

*Although the Owner-pilot is and remains solely and legally responsible for the maintenance of their gyroplane, ***some*** Owner-pilots can afford, and prefer, to engage professional technicians to maintain their aircraft (either AMEs or LAMEs). **While this is permissible if the AME or LAME hold an authorisation issued by ASRA to undertake such maintenance. However, in contrast to general-aviation, the Owner-pilot remains legally liable for the efficacy of the servicing.**

Authorized Daily Maintainer: The Owner (OR a full ASRA pilot-certificate holder which the owner is allowing to use the gyroplane on the day of operation).

35.01 CASA mandates that '… a daily inspection 'is one of the most important inspections for an aircraft in service. It is the only thorough inspection between periodic inspections, and it is the last real opportunity to inspect the aircraft to ensure that:

(a) It is airworthy and fit to fly.
(b) all mandatory Directives and Alerts have been carried out.
(c) its equipment is serviceable and suitable for the day's particular operation/s.'

35.02 CASA also mandates that ' … the major difference between the daily and 'pre-flight' therefore carry it out and certify for its completion', usually in the current Release to Service document.

ASRA student pilot certificate holders are not permitted to Certify Daily inspections but can participate in them under the direct supervision of their Instructor.

CAUTION

THIS CHECKLIST IS ONLY TO BE USED IF THE GYRO MANUFACTURER OR THE GYRO AMATEUR BUILDER OR REBUILDER HAS NOT CREATED ONE AND INCLUDED IT IN THE FLIGHT MANUAL. IF THIS DEFAULT CHECKLIST IS USED, IT IS ENTIRELY THE OWNER'S RESPONSIBILITY TO ENSURE THE ANY LISTED PROCEDURE NOT RELEVANT TO THEIR GYRO ISN'T DONE, AND THAT ANY PROCESS OR INSPECTION RELEVANT TO THEIR GYRO THAT ISN'T LISTED IS DONE ANYWAY.

The ASRA Daily Inspection

35.03 **THE ASRA DAILY INSPECTION** (if no other Daily specified)

(1) *Check* that the ignition switches are off, the mixture control (if fitted) is at lean or cut off position, the throttle is closed, and the fuel selector is **on**

(2) *Check* that the battery is sufficiently charged – switch on the Battery Master switch and check the ammeter to see if the battery reading is showing sufficient voltage for engine start up. Master switch then switched off.

(3) *Check* that the propeller blades are free from cracks, bends and detrimental nicks, that the propeller spinner (if fitted) is secure and free from cracks, that there is no evidence of oil or grease leakage from the propeller hub or actuating cylinder (if fitted) and that the propeller hub, where visible, has no evidence of any defect which would prevent safe operation.

(4) *Check* that the engine air induction system and all cooling air inlets are free from obstruction and that the radiator core is clear of dried grass or other build-up.

(5) *Check* that the engine, where visible, has no fuel or oil leaks and that the exhaust system is secure and free from cracks.

(6) *Check* that all V-belts on the engine or in the pre-rotation system are in good condition and correctly tensioned.

(7) *Check* that the oil quantity is within the limits specified by the manufacturer for safe operation and that the oil filler cap, dipstick, and inspection panels are secure.

(8) *Check* that the engine cowlings and cowl flaps (if fitted) are secure.

(9) Safely get into a position to check the lower and upper surfaces of each rotor blade, paying particular attention to cleaning off accumulated dead-insect leading edge build-up, as well as checking for upper surface bird or other animal droppings, or splashed-up mud or livestock excreta if operating in muddy conditions. Clean surfaces as necessary. Then visually and fingertip check cleaned surfaces for cracking or other damage, especially leading-edge nicks caused by flicked-up stones and gravel.

(10) Visually check that all hub and hub-bar or side-plate fasteners, and blade grip/ strap fasteners are secure and in unchanged condition, and that all hub components including pre-rotators and rotor brakes, are also secure and in working order. Check security of the teeter bolt and of the torque tube and crossbar spherical Rod Ends.

(11) *Check* that the landing gear tyres are free from cuts or other damage, have no plies exposed and, by visual inspection, are adequately inflated.

(12) *Check* that the landing gear stance appears to be within normal static limits with no slumping or leaning to either side, and that the height between the pod underbody/keel and the ground is not lower than normal.

(13) *Check* that the pod (if fitted) and visible airframe surfaces are free from damage and that any inspection panels or caps, rear stabilizer surfaces are secure, and rotor flight control rods (or push-pull cables) are capable of unrestricted and free full fore-aft and side-to-side manipulation via the control stick.

(14) *Check* that the rudder pedals are capable of complete and unrestricted left-to-right and right-to-left movement and rudder cables are tensioned correctly and check that the tail assembly is fully secure and clean and that the rudder is capable of full left and right unrestricted sweep to its stops.

(15) *Check* that the pitot head and static ports are free from obstruction and that the pitot cover is removed or is free to operate.

(16) *Check* that the fuel tank filler caps, chains, vents and associated access panels are secure and free from damage. Visually check fuel quantity and undertake a water-in-fuel drain check into a clean transparent container for close visual checking.

(17) *Check* that the radios and antennae are secure and that where visible, radio units and inter-wiring are secure.

(18) *Check* that the windscreen is clean and free from damage.

(19) *Check* that the instruments are free from damage, legible and secure.

(20) *Check* that the seat belts, buckles and inertia reels (if fitted) are free from damage, secure and functioning correctly.

UPON COMPLETION OF THE DAILY INSPECTION THE OWNER OR AUTHORIZED FULL PILOT CERTIFICATE HOLDER IS TO PROMPTLY CERTIFY COMPLETION IN COLUMN 2 OF ASRA FORM F008.

PRE-FLIGHT INSPECTION – As specified in the Flight Manual

POST FLIGHT INSPECTION - As specified in the Flight Manual

CAUTION

THIS CHECKLIST IS ONLY TO BE USED IF THE GYRO MANUFACTURER OR THE GYRO AMATEUR BUILDER OR REBUILDER HAS NOT CREATED ONE AND INCLUDED IT IN THE FLIGHT MANUAL. IF THIS DEFAULT CHECKLIST IS USED, IT IS ENTIRELY THE OWNER'S RESPONSIBILITY TO ENSURE THE ANY LISTED PROCEDURE NOT RELEVANT TO THEIR GYRO ISN'T DONE, AND THAT ANY PROCESS OR INSPECTION RELEVANT TO THEIR GYRO THAT ISN'T LISTED IS DONE ANYWAY.

35.04 50-Hourly Inspection

THIS IS AN <u>ELECTIVE</u> INSPECTION ONLY – NOT LEGALLY REQUIRED UNDER THE REGULATIONS, BUT VERY STRONGLY RECOMMENDED BY ASRA, ESPECIALLY FOR:

(a) **2-SEAT GYROPLANES USED FOR TRAINING;**

(b) **2-SEAT GYROPLANES USED FOR "TRIAL INSTRUCTIONAL FLIGHTS" (TIFs); OR**

(c) **<u>ANY</u> GYROPLANE USED FOR AERIAL MUSTERING**

ASRA ALSO STRONGLY RECOMMENDS THAT OWNERS OF GYROPLANES USED SOLELY IN PRIVATE OPERATIONS SHOULD ALSO CONSIDER DOING A 50-HOURLY (where many Owners will do an oil change anyway).

Authorized Maintainer: The Owner (+ technical assistance as necessary)

Engine -

- Check and clean Air Filter as per manufacturer's instructions
- Carefully visually check Engine mating surfaces and hose / tube junctions for indications of oil or coolant leaks
- Change Engine Oil (4-strokes)
- Change Engine Oil Filter

NOTE: THE ENGINE MANUFACTURER'S RECOMMENDATIONS DICTATE OIL AND OIL FILTER CHANGE FREQUENCIES – IF YOUR GYRO HASN'T REACHED THE NUMBER OF HOURS NEEDED FOR A CHANGE OR THE OIL HASN'T BEEN CONTAMINATED OR OVERHEATED, THEN NO NEED TO DO THE OIL OR FILTER CHANGES.

- Check gascolator bowl and mesh filter for residue and clean if necessary
- Check colour, condition and gapping of spark plugs
- Check security and condition of Ignition Coil and Leads
- Check Coolant Level

- Check and carefully externally clean Radiator core fins
- Check Battery terminals and Electrical Cables
- Check Exhaust System for cracks

Propeller Re-Drive and Propeller -

- Check propeller re-drive for excess free play and/or oil leaks
- Check and top-up propeller re-drive oil and check magnetic plug (if fitted) for debris
- Check Propeller leading edges and surfaces for nicks, damage or wear, then check hub-plate and hub nut or bolt security and lock-wiring for any breaks. Re-lockwire if any breaks are present.

Rotor Hub and Rotor Assembly -

- Inspect Rotor Hub and Hub Pre-rotator Ring Gear for excessive wear.
- Check bolts holding Ring Gear to Ring Gear Plate (if fitted) for security
- Ensure that any electric pre-rotator has a secure and serviceable earthing strap attached to the mast that does not restrict hub tilting in any direction
- Check electric pre-rotator and electrical connections for function and security
- Check that any Bendix unit in the pre-rotator is adequately clean and lubricated if necessary to ensure proper engagement / disengagement
- (Non-ball-bearing greased-teeter-bushing gyros **ONLY**) Remove, clean, re-grease and reassemble Rotor Teeter Tower Flange Bushing Inserts (if fitted) (rotor assembly will most likely need to be carefully lifted clear)
- (All gyros) Check Teeter Bolt for external signs of fretting or unusual wear
- Lubricate the Teeter Ball Bearings (gyros with ball-bearing teeter bearings usually via Zerk fittings or grease nipples)
- Clean and closely examine the leading and trailing edges of rotor blades for dings, dents, nicks, stone damage or excessive erosion or abrasion using both fingertip feel as well as a 10x magnifying glass. Carefully also review all upper and lower blade surfaces for cracks, slight depressions, distortions, kinks, or scratches. Photograph any anomalies and consult with TAs, STAs or the HAM if concerns arise
- Check that all nuts on the hub-bar or side-plates and blade retention straps are tight to the required minimum torques (NOTE: Do NOT undo the nuts – simply check they do not start to undo at the specified minimum torques. If they do start to undo – re-torque to the blade manufacturer's specified torque)
- Check trim system electric, pneumatic, or manual trim system lines, cables and springs for secure attachment and function in the proper direction
- Check rotor brake pads, linings, cables or hydraulic or air lines and check that the rotor brake does not unduly drag on its bearing surface when released

Control rods -

- Check all Rod Ends for side and end-play
- Check all control rods for any wear or damage, and lock-wire security (if fitted).

Tail Assembly -

- Closely check all rudder cables and fittings for correct specified cable tension as well as any wire fraying along entire length of the cabling
- Closely check all rudder hinges for undue looseness of the hinge or hinge pins
- Closely check the stabilizer assembly's fastening to the airframe

Undercarriage -

- Check Wheel Rims and Tyres for damage and correct pressure.
- Check Brake lines or cables for wear, leaks and security.

CAUTION

THIS CHECKLIST IS ONLY TO BE USED IF THE GYRO MANUFACTURER OR THE GYRO AMATEUR BUILDER OR REBUILDER HAS NOT CREATED ONE AND INCLUDED IT IN THE FLIGHT MANUAL. IF THIS DEFAULT CHECKLIST IS USED, IT IS ENTIRELY THE OWNER'S RESPONSIBILITY TO ENSURE THE ANY LISTED PROCEDURE NOT RELEVANT TO THEIR GYRO ISN'T DONE, AND THAT ANY PROCESS OR INSPECTION RELEVANT TO THEIR GYRO THAT ISN'T LISTED IS DONE ANYWAY.

35.05 100-Hourly Inspection

THIS IS A LEGALLY COMPULSORY INSPECTION, REQUIRED UNDER THE REGULATIONS, FOR:

(a) **-SEAT GYROPLANES USED FOR TRAINING; AND**

(b) **2-SEAT GYROPLANES USED FOR "TRIAL INSTRUCTIONAL FLIGHTS" (TIFs).**

ALTHOUGH NOT A LEGAL REQUIREMENT FOR GYROPLANES INVOLVED IN AERIAL MUSTERING, ASRA NONETHELESS STRONGLY ENCOURAGES MUSTERING PILOTS TO DO 100-HOURLYs.

Authorized Maintainer: The Owner (+ technical assistance as necessary)

ALL DEFECTS DISCOVERED MUST BE FIXED OR ADJUSTMENTS NEEDED MUST BE DONE BEFORE THE INSPECTION CAN BE CONSIDERED COMPLETE AND AN f007 'RELEASE TO SERVICE' SIGNED

- Undertake 50-Hourly Inspection

PLUS:

- Fit new properly-gapped spark plugs if existing plugs show erosion
- Check Engine Mounts for cracks or deterioration and mounting rubbers for any deterioration
- Check the security of the Pre-Rotator 90-degree gearbox (if fitted) and closely check for input and output shaft looseness or rubber boot deterioration – replace a necessary. For gyros with Wunderlich pre-rotator cable drives check the security of attachment brackets and for adequate cable lubrication
- Closely check the condition of Pre-Rotator V-belts and adjust take-up tension if necessary
- Clean and closely check Hub Bar or hub side-plates and blade retention straps / plates for cracks (preferably using something like a 10X magnifying glass)

- Clean and closely check all mast, keel and bracing undercarriage struts, attachment brackets, and cluster and cheek plates, for cracks, damage, corrosion or evidence of fretting. Check torques of all fastener nuts on cluster and cheek plates.
- Check Radiator Mounts for chafing and leaks
- Check Compression of each cylinder (usually a 2-person task)
- Check Undercarriage horizontal struts (and axles) for bowing or bending, and wheel bearings for spalling or rough running (replace if necessary), and wheel rims for corrosion, cracking or damage (replace if necessary)
- Check Rudder Cables for correct tension and Bellcranks and Horns for excessive wear
- Check Nose Wheel Steering left-to-right range, especially checking for any binding
- Check Nose Wheel Shaft for End Play
- Check Rudder Pedals for freedom of movement and lubricate Pivot Points
- Check Wheel Bearings for smoothness and End Play
- Check mainwheel brake discs or drums for warping, distortion or damage
- Check Rudder for cracks around hinge points
- Check main Control Tube Front and Rear “L” Bracket Pivot Points for excessive play
- Check main undercarriage locating blocks on keel (if fitted)
- Grease front wheel downtube, check spring for sag.
- Inspect undercarriage top rubber suspension (if fitted)

CAUTION

THIS CHECKLIST IS ONLY TO BE USED IF THE GYRO MANUFACTURER OR THE GYRO AMATEUR BUILDER OR REBUILDER HAS NOT CREATED ONE AND INCLUDED IT IN THE FLIGHT MANUAL. IF THIS DEFAULT CHECKLIST IS USED, IT IS ENTIRELY THE OWNER’S RESPONSIBILITY TO ENSURE THE ANY LISTED PROCEDURE NOT RELEVANT TO THEIR GYRO ISN’T DONE, AND THAT ANY PROCESS OR INSPECTION RELEVANT TO THEIR GYRO THAT ISN’T LISTED IS DONE ANYWAY.

35.06 ANNUAL INSPECTIONS

LEGALLY COMPULSORY FOR ALL ASRA GYROPLANES – ASRA suggests that this inspection might ideally be done in the period mid-SEP to NOV to align with the Listing Renewal processes

Authorized Maintainer: The Owner (+ technical assistance as necessary)

ALL DEFECTS DISCOVERED MUST BE FIXED OR ADJUSTMENTS NEEDED MUST BE DONE BEFORE THE INSPECTION CAN BE CONSIDERED COMPLETE AND AN f007 'RELEASE TO SERVICE' SIGNED

Engine -

- Check and clean Air Filter as per manufacturer's instructions
- Carefully visually check Engine mating surfaces and hose / tube junctions for indications of oil or coolant leaks
- Change Engine Oil
- Change Engine Oil Filter

NOTE: THE ENGINE MANUFACTURER'S RECOMMENDATIONS DICTATE OIL AND OIL FILTER CHANGE FREQUENCIES – IF YOUR GYRO HASN'T REACHED THE NUMBER OF HOURS NEEDED FOR A CHANGE OR THE OIL HASN'T BEEN CONTAMINATED OR OVERHEATED, THEN NO NEED TO DO THE OIL OR FILTER

- Check Compression of each cylinder (usually a 2-person task)
- Install new properly gapped spark plugs if existing plugs show erosion.
- Check gascolator bowl mesh filter for residue and clean if necessary
- Check Engine Mounts for cracks or deterioration and mounting rubbers for any deterioration.
- Check security and condition of Ignition Coil and Leads
- Check Radiator Mounts for chafing and leaks
- Check Coolant Level
- Check and carefully externally clean Radiator core fins
- Check Battery terminals and Electrical Cables
- Check Exhaust System for cracks

Mast and Engine Mount Junction –

- Check the security of the Pre-Rotator 90-degree gearbox (if fitted) and closely check for input and output shaft looseness or rubber boot deterioration – replace a necessary. For gyros with Wunderlich pre-rotator Flex cable drives check the security of attachment brackets and for adequate Flex cable lubrication
- Closely check the condition of Pre-Rotator V-belts (if fitted) and adjust take-up tension if necessary
- Check trim system electric, pneumatic, or manual trim system lines, cables and springs for secure attachment and function in the proper direction Clean and closely check all mast, keel and bracing undercarriage struts, attachment brackets, and cluster and cheek plates, for cracks, damage, corrosion or evidence of fretting. Check torques of all fastener nuts on cluster and cheek plates.

Propeller Re-Drive and Propeller -

- Check propeller re-drive for excess free play and/or oil leaks
- Check and top-up propeller re-drive oil and check magnetic plug (if fitted) for debris
- Check Propeller leading edges and surfaces for nicks, damage or wear, then check hub-plate and hub nut or bolt security and lock-wiring for any breaks. Re-lockwire if any breaks are present.

Rotor Hub and Rotor Assembly – Owner – See Section 27 Maintenance Authorisation Table – Page106

- Inspect Rotor Hub and Hub Pre-rotator Ring Gear for excessive wear.
- Check bolts holding Ring Gear to Ring Gear Plate (if fitted) for security
- Clean and closely check Hub Bar or hub side-plates and blade retention straps / plates for cracks (preferably using something like a 10X magnifying glass)
- Ensure that any electric pre-rotator has a secure and serviceable earthing strap attached to the mast that does not restrict hub tilting in any direction
- Check electric pre-rotator and electrical connections for function and security
- Check that any Bendix unit in the pre-rotator is adequately clean and lubricated if necessary to ensure proper engagement / disengagement
- Check rotor brake pads, linings, cables or hydraulic or air lines and check that the rotor brake does not unduly drag on its bearing surface when released
- (Non-ball-bearing greased-teeter-bushing gyros **ONLY**) Remove, clean, re-grease and reassemble Rotor Teeter Tower Flange Bushing Inserts (if fitted) (rotor assembly will most likely need to be carefully lifted clear)
- (All gyros) Check Teeter Bolt for external signs of fretting or unusual wear
- Lubricate the Teeter Ball Bearings (gyros with ball-bearing teeter bearings usually via Zerk fittings or grease nipples)

Rotor Blades – Owner – Section 27 Maintenance Authorisation Table – Page 106

- Clean and closely examine the leading and trailing edges of rotor blades for dings, dents, nicks, stone damage or excessive erosion or abrasion using both fingertip feel as well as a 10x magnifying glass. Carefully also review all upper and lower blade surfaces for cracks, slight depressions, distortions, kinks, or scratches. Photograph any anomalies and consult with TAs, STAs or the HAM if concerns arise
- Check that all nuts on the hub-bar or side-plates and blade retention straps are tight to the required minimum torques (NOTE: Do NOT undo the nuts – simply check they do not start to undo at the specified minimum torques. If they do start to undo – re-torque to the blade manufacturer's specified torque)

Control rods -

- Check all Rod Ends for side and end-play
- Check all control rods for any wear or damage, and lock-wire security (if fitted).

Tail Assembly -

- Closely check all rudder cables and fittings for correct specified cable tension as well as any wire fraying along entire length of the cabling
- Check Rudder Bellcranks and Horns for excessive wear or play
- Closely check the fastening of the stabilizer assembly to the airframe
- Closely check all rudder hinges for undue looseness of the hinge or hinge pins
- Check rudder for cracks around hinge points

Undercarriage -

- Check Wheel Rims and Tyres for damage and correct pressure.
- Check Brake lines and pads or cables for wear, leaks and security.
- Check Undercarriage horizontal struts (and axles) for bowing or bending, and wheel bearings for spalling or rough running (replace if necessary), and wheel rims for corrosion, cracking or damage (replace if necessary)
- Check Nose Wheel Steering left-to-right range, especially checking for any binding
- Check Nose Wheel Shaft for End Play
- Check Rudder Pedals for freedom of movement and lubricate Pivot Points
- Check Wheel Bearings for smoothness and End Play
- Check mainwheel brake discs or drums for warping, distortion or damage
- Check main undercarriage locating blocks on keel (if fitted)
- Grease front wheel downtube, check spring for sag.
- Inspect undercarriage top rubber suspension (if fitted)

OTHER OPTIONAL OR ELECTIVE PERIODIC INSPECTIONS ASRA RECOMMENDS

35.07 200-Hourly Inspection

Authorized Maintainer: The Owner (+ technical assistance as necessary)

- Complete 50 Hourly Inspection
- Complete 100 Hourly Inspection

PLUS:

- Replace Pre-rotator V-belts (NOTE – this procedure will very likely require the propeller to be removed from the propeller hub)
- Closely examine the main Rotor Hub Bearing for continued smooth running.
- Check, and – if necessary - remove Alternator and inspect Brushes and Bearings

35.08 500-Hourly Inspection

Authorized Maintainer: The Owner (+ technical assistance as necessary)

- Complete 50 Hourly Inspection
- Complete 100 Hourly Inspection

PLUS:

- Remove and replace the main Rotor Hub Bearing with a new bearing taking extreme care that it is seated and restrained correctly and with the correct orientation
- Replace all Fuel Hoses
- Replace Coolant Hoses and Coolant
- Check Throttle pivot or shaft for excessive wear
- Replace bearings in main control system if feasible. If bronze bushings are fitted instead, closely check bushings for slop or wear, and replace if necessary.
- Replace mainwheel disc brake pads or drum shoes where applicable

PART 4

PROCEDURES

Modifying or “Hybridizing” Gyroplanes
and
Repairing or Rebuilding
Damaged Gyroplanes

Section 36

CASR PART 103 Manual of Standards (MOS)

“PRODUCTION AIRCRAFT” as defined in CASR Part 103 and modification or repair of ‘production aircraft’ if ‘a manufacturer no longer exist(s) at the time of modification and repair’.

36.01 **RESERVED**.

36.02 **RESERVED**.

36.03 **RESERVED.**

36.04 **RESERVED**.

36.05 **RESERVED**.

Section 37

MODIFYING OR "HYBRIDIZING" GYROPLANES

Conventional Light Aircraft Certification

37.01 As explained in Part 1 of this Manual, modern CASR Part 103 ultralight gyroplanes and basic ultralight gyroplanes are not "certified" like Cessnas and other conventional light aircraft.

37.02 Cessnas and other conventional light aircraft were originally certified in the United States in the 'normal' category. A 'normal' category also exists for rotorcraft, where most civilian light helicopters such as Bell 47s or Bell Jetrangers are placed. Two gyroplane types have achieved acceptance in the post-World War 2 'normal category for rotorcraft', these being the 1960's "Air & Space" 18A two-seat gyroplane, and the late 1960's McCulloch J2 two-seat side-by-side gyroplane. No Air & Space 18As ever made it to Australia, while a small number of J2s arrived in Australia during the 1970's and were placed on the national "VH" register. None are currently airworthy and none have current registration.

37.03 A defining characteristic of aircraft certified into the U.S. 'normal' category is that their basic design is fixed and owners cannot modify or change them to any great extent. If unauthorized modifications are done to a certified aircraft, the Certificate of Airworthiness for that aircraft will be rendered invalid.

Ultralights are less stringently regulated.

37.04 As explained in Part 1 of this Manual, ultralight aircraft have generally evolved through previous generations of amateur construction and incremental experimentation, rather than a dedicated design and development process of the kind that most conventional light aircraft have been through.

37.05 Gyroplanes Listed under CASR Part 103 do not hold conventional 'Certificates of Air worthiness' and are not on the national "VH" aircraft register.

37.06 ASRA indirectly achieves ultralight gyroplane airworthiness by its emphasis on Gyroplane Construction Standards, and ASRA policy is that IF a gyroplane conforms to the Construction Standards, then ASRA will not stand in the way of a member flying their gyroplane at his or her own risk.

37.07 This "non-interference if the gyroplane conforms to Construction Standards" principle also applies to any modification that any owner makes to their gyroplane, with the exception of any gyroplane accepted as an LSA gyroplane under a Special Certificate of Airworthiness.

Modification of Gyroplanes

37.08 The process of **MODIFICATION** is where a serviceable undamaged feature, component, or the entire gyroplane is changed in some way to improve its performance, utility, reliability and safety.

37.09 ASRA has 3 levels of modification. They are:

(a) **MINOR MODIFICATIONS**;

(b) **MID-LEVEL MODIFICATIONS**: and

(c) **MAJOR MODIFICATIONS**.

Modification of Commercially Manufactured Gyroplanes – "Hybridizing"

37.10 ASRA will neither encourage nor oppose any plan by a member to modify his or her commercially-produced gyroplane. In such a decision ASRA will remain neutral.

37.11 Any owner of a commercially produced gyroplane contemplating making modifications needs

to consider the following points:

(a) the manufacturer might vigorously oppose the plan, threatening to cancel any warranty or ongoing support;

(b) any modification to a known and familiar gyroplane design is likely to seriously affect its current and resale value; and

(c) at the end of the day, a modification an owner attempts but mucks up might result in the gyroplane not conforming with ASRA Gyroplane Construction Standards.

37.12 ASRA strongly suggests that owners of commercially-manufactured gyroplanes contemplating making significant modifications to their gyroplane contact the manufacturer or the manufacturer's local agent to discuss their aspirations.

Modification of Hybrid or Amateur-Built Gyroplanes

37.13 ASRA has a rich history of safe and responsible amateur-building, amateur-modification, and amateur hybridization of gyroplanes. Owners of amateur-constructed gyroplanes are generally free to experiment with changes to their gyroplane. Many modifications or changes are minor. Some modifications are mid-level. Some are major. All modifications must be done in such a way as to ensure the gyroplane always continues to comply with Gyroplane Construction Standards.

MINOR MODIFICATIONS

37.14 **Minor** modifications can be undertaken WITHOUT an inspection by a Technical Adviser being required when completed, and the gyroplane can resume flying with no reservations or restrictions.

Examples of Minor Modifications

37.15 Some examples of **MINOR** modifications are:

(a) fitting different length rotor blades (from the same blade manufacturer) or different blades from a different manufacturer that have identical attachment fittings to the original blades.

NOTE VERY CAREFULLY:

Blade assembly swapping occurs sometimes at Fly-Ins, particularly where there are large numbers of trailered-in homebuilt gyros attending, where mounting and demounting of the rotor assemblies and unbolting one blade from that assembly is normal before flying starts and after it ends.

Owners who are "blade swapping" must take extreme care to ensure that the teeter range of any substituted hub-bar is close to the original teeter range of the original rotor assembly. Simply bolting on a different hub-bar without checking the teeter range has been implicated in one Australian fatality where post-crash inspection revealed the substituted hub bar had an overly constrained teeter range.

On the other hand, if the teeter range of a substituted rotor assembly is too great, then a real risk of the rotor striking the vertical stabilizer or rudder may arise.

(b) swapping out a "like-for-like" engine (make sure appropriate gyro logbook entries are made);

(c) changing to a new propeller (make sure sufficient propeller tip clearance to rotor and keel are retained)

(d) replacing "like-for-like" older components for newer versions;

(e) fitting different wheels and tyres;

(f) fitting a different wheel braking system;

(g) changing or updating the instruments, radios and Nav devices;

(h) fitting a new “pod” that is mostly similar to the original one;

(i) replacing or upgrading old electrical wiring and installing additional wiring for other devices;

(j) upgrading a seat tank for a recent-manufacture one;

(k) installing a supplementary fuel tank (as long as it does not alter the hang-test angle of the gyroplane);

(l) plumbing any supplementary fuel tank;

(m) repainting the gyroplane;

(n) fitting Go-Pro camera mounts and other camera mounts; and

(o) fitting small racks or paniers to securely carry items.

MID-LEVEL MODIFICATIONS

37.16 **Mid-Level** modifications can also be undertaken WITHOUT an inspection by a Technical Adviser being required when completed; BUT after the mid-level modification is completed the gyroplane **IS SUBJECT TO A “SHAKEDOWN” FLYOFF PERIOD OF TEN HOURS WHERE (IF A 2-SEATER) A 2ND OCCUPANT CAN’T BE CARRIED**. Once the ten hours is completed without complication, that fact is to be entered into the gyroplane logbook and the gyroplane can resume flying with no reservations or restrictions.

Examples of Mid-Level Modifications

37.17 Some examples of **MID-LEVEL** modifications are:

(a) where the proposed modification is likely to increase the permanent Empty Weight of the gyroplane by **15% or more**;

(b) where a newly substituted engine and/or propeller combination is likely to result in static thrust **LOWER** than what it is replacing;

(c) where modifications or upgrading of the existing engine are likely to increase power output by **20% or more**; and

(d) where the proposed modification will result in the propeller thrust-line being repositioned by **by not more than 50mm** in any direction from the original position, or where the modification will result in a change in the thrust-line angle.

MAJOR MODIFICATIONS

37.18 **Major** modifications, however, are modifications that are likely to significantly affect the performance and handling of the gyroplane.

37.19 Once a Major Modification is started, the gyroplane’s Approval to Fly / SAB Flight Permit is **AUTOMATICALLY SUSPENDED** until a Technical Adviser has reviewed the completed modification and cleared it as complying with Construction Standards. Once that signature is placed on the ASRA Form F006, the Approval to Fly / SAB Flight Permit will resume.

WHERE A 2-PLACE GYROPLANE HAS UNDERGONE A MAJOR MODIFICATION, THE GYROPLANE WILL BE SUBJECT TO A 40-HOUR SOLO FLYOFF PERIOD OF EVALUATION, WHERE A 2ND OCCUPANT CANNOT BE CARRIED.

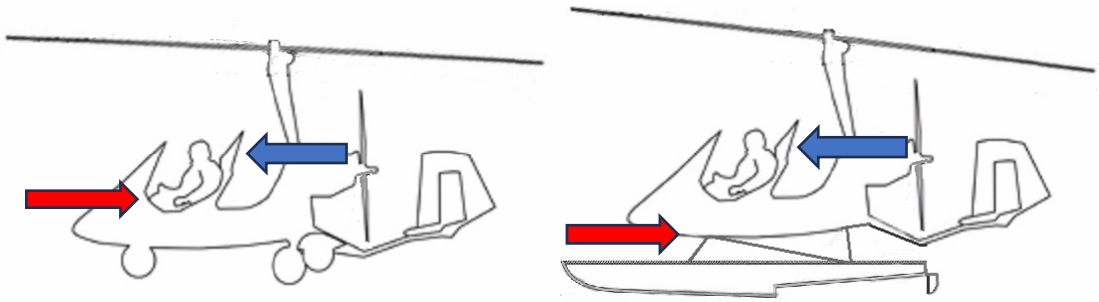
IF THE MAJOR MODIFICATION DOES NOT PRESENT ANY PROBLEMS DURING THAT PERIOD, NORMAL DUAL OPERATIONS MAY RESUME.

Examples of Major Modifications

37.20 Examples of Major Modifications are:

(a) the fitting of floats to a gyroplane, either after-market or OEM (Original Equipment Manufacturer) supplied by the manufacturer's representative;

WARNING – THE FITTING OF FLOATS IS LIKELY TO SERIOUSLY AFFECT THE THRUST-LINE TO CENTRE-OF-DRAG RELATIONSHIP



(b) where a non-turbine* **new engine type** not previously recorded on the ASRA database is installed;

(c) where the proposed modification will result in the propeller thrust-line being repositioned by **more than 50mm** in any direction from the original position, or where the modification will result in a change in the thrust-line angle;

(d) where a single-seat gyroplane is proposed to be modified into a side-by-side **two-seater** by the substitution of a bench-type seat, revised fuel tankage, and duplicated controls;

(e) where the owner proposes to make any gyro frame configuration changes where the keel or mast are **permanently repositioned, re-angled or changed in length(s)** *to any extent*, such as converting a single-seat gyro into a Parsons-type two-seater or a "utility" by longitudinal keel lengthening and insertion of a supplementary upright beam and upper cross-beam;

(f) where the owner proposes to **convert** a tri-gear **undercarriage** gyro to a mainwheel-tailwheel configuration or vice versa; and

(g) where, on a tri-gear gyroplane, the owner proposes to **reposition the ground-contact points** of the mainwheel tyres forward or backward by **more than 75mm**.

* *turbine engines are expressly prohibited by regulation in CASR Part 103 aircraft*

IMPORTANT NOTE: OWNERS MUST ENSURE THAT, ONCE COMPLETED, THE MAJOR MODIFICATION CONFORMS TO ASRA GYROPLANE CONSTRUCTION STANDARDS. A T.A. INSPECTION IS MANDATORY UPON COMPLETION. THE HAM WILL NOMINATE THE TA.

Notification Requirements for Proposed Major Modifications

37.21 CASA requires ASRA to monitor Major Modifications. Owners who are setting out on Major Modifications of the kind set out above are notify the ASRA Head of Airworthiness and Maintenance (HAM) using ASRA Form F012 emailed to technical@asra.org.au.

[A sample ASRA Form F012 is set out on the next page]

Australian Sport Rotorcraft Association Incorporated

F012 – MAJOR MODIFICATION NOTIFICATION

Email to: technical@asra.org.au

ABN 53 412 417 012

Member Name:	Member Number:	Gyro Number:
Member email address:		
Contact phone number:		

To the Head of Airworthiness & Maintenance, ASRA. As required by the ASRA Technical Procedures Manual, Section 35, I now give notice that I:

(a) I intend to undertake a Major Modification of the kind listed in para 35.35 of the TPM; or

(b) I have undertaken a Major Modification of the kind listed in para 35.35 of the TPM.

(strike out whichever is inappropriate)

Brief details are as follows:

PLEASE NOTE THAT THE HEAD OF AIRWORTHINESS AND MAINTENANCE WILL NOMINATE A TECHNICAL ADVISER TO UNDERTAKE THE INSPECTION.

I certify that all the information detailed above is true and correct

Signature of Member

Date:

Section 38

ROTOR BLADES AND HUB BARS

38.01 Rotor blades are obviously **CRITICAL** components and must always be handled with extreme care.

38.02 While it is still possible for an amateur builder to fabricate their own set of blades, in almost every case nowadays, rotor blades are sourced from commercial manufacturers either as original equipment (or OEM) fitted by a gyroplane manufacturer, or from a blade importer or distributor.

38.03 The combination of 2 opposing blades rigidly bolted to a central hub arrangement is called a **rotor assembly**. Blades are almost always sold as matched and balanced pairs as part of a rotor assembly.

38.04 Rotor blades can be classified into 2 main types:

(a) Aluminium blades, whether fully extruded or fabricated by wrapping and bonding aluminium upper and lower skins to an extruded “D” leading edge spar; or

(b) Composite blades, fabricated by “laying up” or laminating glass fibre or carbon fibre rovings infused with epoxy resin into airfoil-shape moulds.

38.05 Approximately 70% of the Australian gyroplane “fleet” are using fully extruded aluminium blades, 5% fabricated aluminium blades, and the remaining 25% composite blades.

Extruded Rotor Blades

38.06 Most extruded rotor blade assemblies (imported mostly from various European manufacturers) have quite generous service life allowances, with retirement time in service mandated by the manufacturers. Aluminium blades are almost always attached to hub assemblies by a series of bolts mounted vertically through metal straps or plates that join the blades to the hub bars.

38.07 For guidance on rotor blade assembly service lives, refer to the various manufacturer’s Maintenance Manuals. Some extruded blades (such as Australian AK blades) have indefinite life, but the hub bars to which they attach are usually life-limited.

38.08 For specific guidance on the issue of aluminium hub-bar failure, see ASRA AIRWORTHINESS DIRECTIVE No. 2008.01 - Dated - 1 May 2008. Title: Gyroplane Hub-bars. That AD was the result of extensive research undertaken after a single-seater musterer fatality in Outback Queensland, and the AD remains as valid today as when first issued.

Composite Rotor Blades

38.09 Composite Rotor blades usually have an indefinite service life, where their ongoing serviceability is assessed on an “on condition” basis. Most composite blades have hub arrangements that do not involve an aluminium hub bar. Instead, the usual arrangement is that the composite blades are retained by 2 large bolts positioned horizontally through each blade “root”. These bolts then penetrate matching holes in flattened-triangular-shaped “side plates”, either chrome-moly steel or titanium. One such manufacturer of this type of composite rotor assembly is Italy’s Magni gyroplanes.

38.10 A particularly noteworthy fact is that there has never been any known or recorded failure of a gyroplane side-plate hub arrangement.

Storage and transport of Rotor Blades

38.11 ASRA strongly encourages that demounted rotor blades be stored – and transported – in purpose-built blade storage crates, where the blades are preferably to be stored with the chord line orientated vertically, with the leading edge down.

The Issue of Repair of Rotor Blades

38.12 Like any other gyroplane component, rotor blades can acquire damage to varying degrees. Useful classifications of the level of damage are:

(a) **Superficial Damage** where a blade has sustained some “hangar rash” or where the blade tip regions are showing erosion caused by operating in sandy or dusty conditions, of where a blade leading edge might have been hit and pockmarked by gravel thrown up by tyres on a dirt runway. Where superficial damage of this kind has been sustained, the Owner can undertake remedial actions, such as:

(I) touch-up painting hangar rash or epoxy filling small blunt dents; or

(II) repainting dust/sand eroded leading edges or fitting “helicopter tape” and re-balancing; or

(III) for small pockmarks, “dressing out” the area of damage, then epoxy filling and finish painting.

NOTE: Dents or dings that have been created by the impact of sharp objects such as screwdrivers or tool points and which feature sharp-edged characteristics are likely to be a “stress raiser”, in which case the Owner should desist with attempting repair and contact the ASRA HAM.

(b) **More Extensive Damage** Any blade damage or deterioration beyond a superficial level cannot be field-repaired. If more extensive damage or deterioration (such as composite delamination) has been detected, the ASRA HAM is to be immediately contacted.

(c) **Major Rotor Damage** The classification of Major Rotor Damage arises in every case where a rotating blade has struck or been struck by any other object or has hit the ground, whether glancingly or in a full-on impact.

IN ALL CASES OF MAJOR DAMAGE OF THIS KIND, THE BLADE MUST BE IMMEDIATELY RETIRED FROM SERVICE. THE HUB-BAR TO WHICH IT WAS ATTACHED AND THE OPPOSITE BLADE ARE REGARDED AS SUSPECT AND WILL USUALLY ALSO BE PERAMENTLY RETIRED FROM SERVICE.

38.13 ASRA **PROHIBITS** any repair attempt on blades that have sustained Major Rotor Damage.

38.14 The reasons for this policy are threefold:

(a) ASRA and its officers are **NOT** an airworthiness certification entity;

(b) rotors are entirely “closed-out” components, incapable of internal field inspection for defects or deterioration; and

(c) no price can be placed on the value of human life, but replacement gyroplane rotor blades are comparatively cheap. For instance, Robinson R22 helicopter blades have a service life of 2,200 hours and are priced (2021) at $37,000 USD (approx. $55,000 AUD) per matched and balanced set. Contrast this to where a replacement gyroplane extruded rotor assembly (complete) can usually be imported or obtained locally for between $6,000 to $12,000 AUD (2022 pricing).

Section 39

DAMAGE AND REPAIR

Damage trends

39.01 Gyroplanes, like any vehicle, tend to acquire minor “wear and tear” damage or “hangar rash” which can usually be tidied up and fixed without difficulty.

39.02 Operational damage comes about from things like hard landings, where an undercarriage strut, struts and axles might be bent, and in a bad case of hard-landing rotor deflection a blade might strike and damage the rudder. Rudder strike is also quite likely during a take-off attempt blade “flapping” incident.

39.03 Rotor blade damage is mainly covered in Section 25 of this manual, and in cases where a spinning blade has smashed across a rudder, the blade may need to be retired. However, there are known cases of extruded aluminium blades only having had very slight superficial marking after having smashed lightweight rudders, or vegetation.

39.04 Unfortunately, the next level of damage is usually ***severe***, where a gyroplane has undergone:

(a) a serious blade flapping incident during a take-off attempt resulting in the gyroplane rearing up, losing directional control, or both, and then rolling or tipping over; or

(b) having had an extra-hard landing and losing directional control, and then rolling or tipping over.

39.05 In either case, a gyroplane tipping over with the rotor at or near flight rpm, will always result in ***severe,*** or Major damage.

39.06 Even though many of these take-off or bad landing accidents occur at relatively low ground speeds, the extreme shock to the structure of the spinning rotor suddenly impacting the ground usually destroys the rotor assembly, snaps or bends the mast, distorts the undercarriage, often twists or distorts the keel frame, and either badly damages or destroys at least the vertical stabilizer and rudder.

39.07 Somewhat surprisingly, rotor hub components usually don’t fracture and may even superficially look intact, but in almost every case if subjected to close scientific examination damage “witness marks” and other indications of overstress can be detected.

39.08 Owners can usually consider themselves lucky if the fuselage pod come out of such an accident. Interior fittings within the pod can sometimes show damage, such as seat-tank mounts and other fittings.

39.09 Instruments, radios and Nav gear is usually undamaged and re-useable (if checked).

39.10 Propeller blades are usually destroyed, but propeller hubs are usually salvageable.

39.11 Engines can usually be salvaged and sent for assessment by a qualified Rotax or Subaru technician. Engine accessories and associated items such as radiators, etc, need to be assessed on a part-by-part basis.

39.12 The financial consequences of a tip-over accident are usually ***extreme***.

Major accident damage to Commercially-Manufactured Gyroplanes

39.13 Owners pulling themselves from a tipped-over gyro instinctively know that their gyroplane is severely damaged. The question then arises, “What to do with it?”

39.14 The first thing to always do is to immediately contact the Australian agent or importer of the Gyroplane type, or alternatively to make inquiries with the manufacturer directly (who will usually refer the owner to the Australian agent anyway).

39.15 Most gyroplane manufacturers are used to requests for “frames, complete” as well as extensive lists of other components necessary to undertake a complete re-build.

39.16 As part of having an organisational System of Maintenance, ASRA now needs to be “kept in the loop” about what is occurring with gyroplanes that have sustained Major Damage.

39.17. The ASRA Form F019 has been created so that in addition to making the compulsory ASRA ATSB on-line Accident Report, an owner also needs to email a completed Form F019 to the Head of Airworthiness and Maintenance (HAM) at email: technical@asra.org.au.

39.18 A significant number of badly damaged Commercially-manufactured European gyroplanes have been successfully rebuilt in Australia over the past 2 decades. Rebuild costs can be significantly reduced if the owner together with other skillful and experienced home-builder members lend a hand.

Rebuilding an Amateur-Constructed gyroplane

39.19 Rebuilding a homebuilt gyroplane is not much different than building one from scratch in the first place. The starting point will always be obtaining 2 ½ x 2 inch rectangular hollow section 6061-T6 extrusion. There are at least 2 suppliers of this important extrusion in Australia, which universally serves as the keel and mast material for most Australian home-built gyros, as well as build-to-order mustering gyros.

39.20 Once the keel and mast replacements are obtained, the process of attaching and/or clamping salvaged components from the damaged machine begins, with new-build parts being attached in lieu of the original damaged or destroyed components.

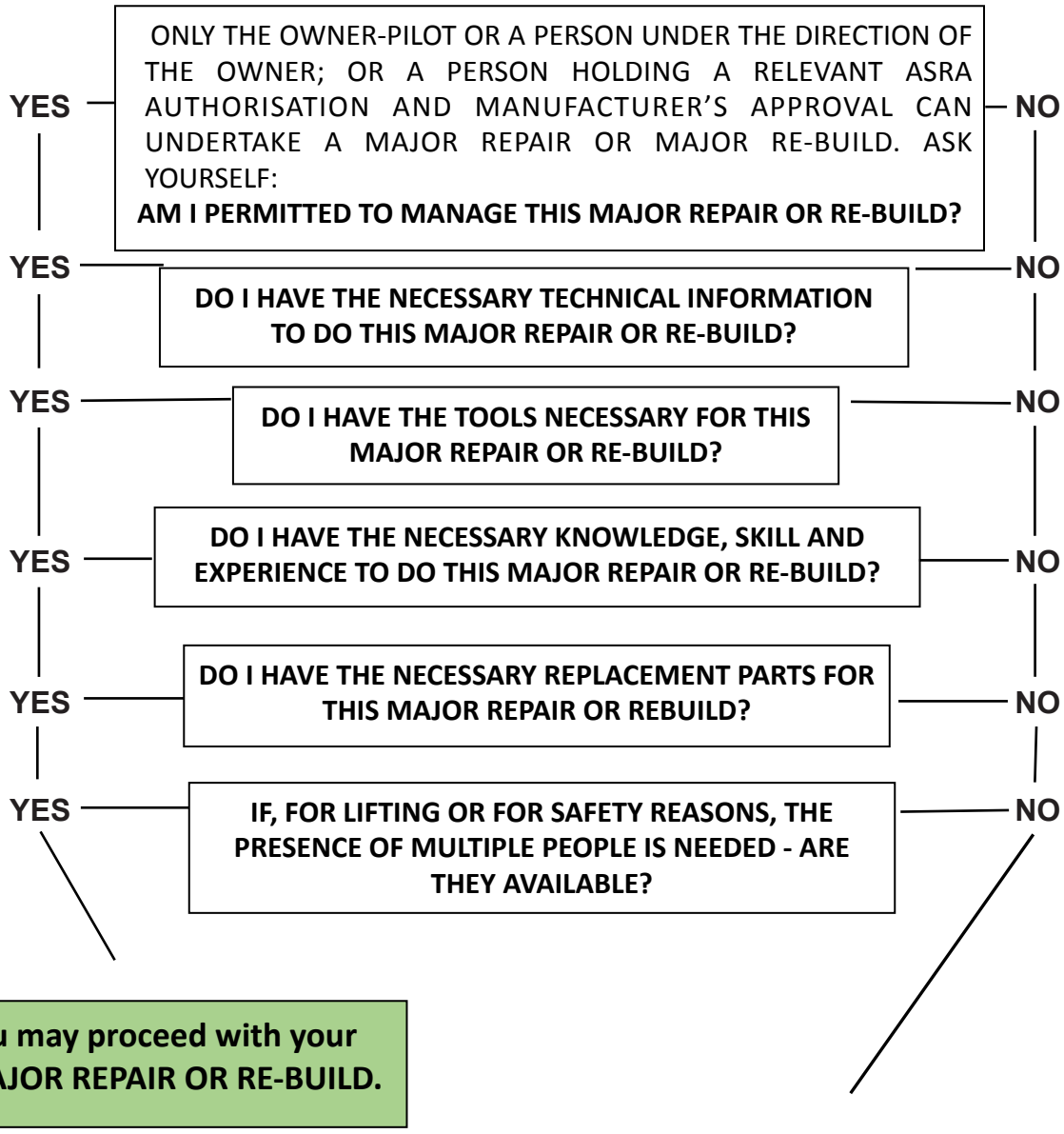
39.21 Home-built gyroplanes can usually be fully re-built over periods of 3 to 6 months and expenditures usually not exceeding $25,000.

39.22 As part of having an organisational System of Maintenance, ASRA now needs to be “kept in the loop” about what is occurring with gyroplanes that have sustained Major Damage.

39.23 The ASRA Form F019 has been created so that in addition to making the compulsory ASRA ATSB on-line Accident Report, an owner also needs to email a completed Form F019 to the Head of Airworthiness and Maintenance (HAM) at email: technical@asra.org.au.

A COPY OF THE 2-PAGE ASRA F019 ‘Major Damage Notification Form, pages 1 and 2, is set out after the following flowchart

Making the decision to manage a Major Repair or Major Re-build by yourself or to arrange for substantial assistance



STOP: DON'T ATTEMPT THE REPAIR OR RE-BUILD, UNLESS:

(1) YOU HAVE ARRANGED FOR APPROPRIATE SKILLED ASSISTANCE, SUCH AS:

(i) A Manufacturer's Authorised Representative (usually the Australian agent)

(ii) A Rotax or Subaru-qualified engine technician, as needed.

(iii) A highly skilled welder (preferably aircraft qualified, but highly skilled automotive could be suitable);

(iv) A skilled automotive or aviation electrician, or radio technician, if needed; or

(v) A fellow ASRA member skilled in the maintenance process to be undertaken or a TA or STA or, (some people's preference) a LAME or AME if available.

ATTEMPTING THE MAJOR REPAIR OR MAJOR RE-BUILD WITHOUT APPROPRIATE PROFESSIONAL ASSISTANCE CAN EASILY RESULT THE PROJECT FAILING

Australian Sport Rotorcraft Association Incorporated

F019 – MAJOR DAMAGE NOTIFICATION

Email to: technical@asra.org.au

ABN 53 412 417 012

Member Name:	Member Number:	Gyro Number:
Member email address:		
Contact phone number:		

NOTE: THIS DOCUMENT MUST BE SUBMITTED AFTER YOU HAVE COMPLETED THE ASRA ON-LINE ACCIDENT REPORTING PROCESS.

To the Head of Airworthiness & Maintenance, ASRA. As required by the ASRA Technical Procedures Manual, Section 36, I now give notice that the above-listed gyroplane sustained Major Damage as detailed in the ASRA ATSB on-line Accident Reporting Process.

My intentions and request are:

- ☐ The gyroplane is destroyed and I request the Listing be cancelled.
- ☐ Some parts of the gyroplane are salvageable, and I intend to re-use them.
- ☐ My current intention is to rebuild the gyroplane.

If you intend to rebuild the gyroplane, ASRA requires you to compete the **page 2 damage assessment table**, as well as giving brief details about who will be involved in the rebuild, where it will be done, and how long it is likely to take. See page 2 for further instructions.

Details of rebuild intentions:

PLEASE NOTE THAT THE HEAD OF AIRWORTHINESS AND MAINTENANCE WILL NOMINATE A TECHNICAL ADVISER TO UNDERTAKE THE INSPECTION ONCE THE REBUILD IS COMPLETE.

I certify that all the information detailed above is true and correct

Signature of Member

Date:

Australian Sport Rotorcraft Association Incorporated
F019 – MAJOR DAMAGE NOTIFICATION – page 2

Gyroplane No: _____ Member: _____

Damage Assessment Table

INSERT AN "X" INTO THE MOST APPROPRIATE DESCRIPTOR BOX

COMPONENT	DESTROYED	DISTORTED	REPAIRABLE	USEABLE	UNDAMAGED
Rotor Assembly					
Nosewheel					
Pod / fuselage					
Forward Keel					
Mast					
Rear keel member					
Engine					
Engine mount & frame					
Propeller Redrive					
Propeller					
Undercarriage struts / wheels					
Horizontal Stabilizer					
Vertical Stabilzer / Rudder					

PLEASE EMAIL NOT LESS THAN 2 GOOD QUALITY PHONE PHOTOGRAPHS OF THE DAMAGED GYROPLANE, MAKING SURE THE ENTIRE MACHINE IS VISIBLE IN EACH SHOT.

ANNEXE 1 to ASRA TPM

ASRA STANDARD FLIGHT MANUAL

NOTE: This entire document can be downloaded from the ASRA Website onto your own computer and is ready for the relevant performance information obtained during flight evaluation to be typed in. See further note at bottom of this page.

PREAMBLE

The flowing pages represent a draft flight manual that has been prepared to help owners of new gyroplanes enter data required for the issue of the final ASRA approved flight manual.

You should have Microsoft Word and Excel loaded on your PC.
If you do not have a PC, or do not have the necessary PC skills, contact the Head of Flight Operations or the Head of Airworthiness and Maintenance who can have the flight manual created for you.

Owners are free to edit the following pages with the data that is **relevant to their particular gyroplane**. Headings/fields in **RED** – are mandatory.

Table of Contents
This will be updated once the Flight Manual has been created.

Section 1- Specifications
These are the general details of the gyroplane and are required for identification. If you have 2 options available e.g. 2 sets of rotors, both manufacturers must be listed.

Section 2 – Limitations
This establishes the envelope the gyroplane must be operated within and represents the majority of the mandatory requirements. Clearly some fields are not required for single seat gyroplanes and can be deleted. Text with "?" will require your own parameter to be entered. Follow the instructions on 2.09 to create the graph.

Section 3 – Normal Procedures
These procedures are samples only and can be fully edited with your particulars.

Section 4 – Emergency Procedures
These procedures are samples only and can be fully edited with your particulars except 4.07 (mandatory) which is required to be filled in.

Section 5 – Normal Procedures (Mandatory)
These schedules are samples only and can be fully edited with your particulars.

Section 6 – Maintenance Schedule (Mandatory)
These schedules are samples only and can be fully edited with your particulars

Once the flight manual is filled in with all your relevant details, delete this first page, change all the text back to black, save the file to your PC and submit to the ASRA registrar for final approval. Once approved the Flight Manual will appear on the Gyroplane file and can be downloaded at any time.

GYROPLANE FLIGHT MANUAL

GXXXX

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Insert good quality Gyroplane photo here

SECTION 1

SPECIFICATIONS

1.01 - GENERAL

Gyroplane Type	Tandem/Side by Side/Single Seat ?
ASRA Registration No	G.....
ASRA Approval No	If applicable?
Model	?
Airframe Serial Number	?

1.02 - DIMENSIONS

Length	? m
Height	? m
Width	? m

1.03 - ENGINE

Manufacturer	?
Type	?
Displacement	? cc
Horsepower	?
Cycles	?
Fuel Consumption @ ? rpm	? L/Hr
Approved Oil Grade	?
Serial No	?

1.04 - REDUCTION UNIT

Manufacturer	?
Type	Gear/Belt?
Ratio	? : 1
Approved Oil Grade	?
Serial No	?

1.05 - PROPELLER

Manufacturer	?
Diameter	? in
Pitch	? deg
Serial No	?

1.06 - ROTOR

Manufacturer	?
Rotor Diameter	? ft
Rotor Chord	? in
Materials	?
Serial No	?

1.07 - ROTOR HEAD

Manufacturer	?
Material	?
Prerotator	?
Rotor Tachometer	?
Serial No	?

1.08 - FUEL SYSTEM

Capacity	? ltrs
Unusable	? ltrs
Approved Fuel Grade	?
Delivery System	Fuel Injection/Carburettor?
Fuel Quantity Indicating System	Sight/Digital/Analogue Gauge?
Filter Type	Paper (*no 2 strokes)/inline mesh?
Water Drain	Yes

SECTION 2

LIMITATIONS

COMPLIANCE WITH THE FOLLOWING IS MANDATORY

2.01 - WEIGHT and BALANCE

Empty Weight (Includes oil, coolant and unusable fuel)	? kg
Maximum allowable Take-off Weight	? kg
Minimum Pilot Weight Solo Operations	? kg
Maximum Passenger Weight	? kg
Under seat Storage compartments	? kg
Hang Test at empty weight (nose up/dn?)	? deg
Hang Test at full weight (nose up/dn?)	? deg

2.02 - PERFORMANCE

Take-off Distance to 50 feet (ISA, nil wind) No Prerotator	? m
Take-off Distance to 50 feet (ISA, nil wind) with Prerotator	? m
Sea Level Rate of Climb at "?" KIAS	? ft/min
Minimum Sink Rate at "?" KIAS	? ft/min
Best Glide Ratio at "?" KIAS	X.X:1
Landing Distance from 50 feet at "?" KIAS (ISA, nil wind)	? m
Max operating altitude	? ft

2.03 - SPEEDS

VNE (Never exceed airspeed)	? KIAS
VMIN (Minimum airspeed straight and level flight)	? KIAS
Normal take-off speed	? KIAS
Short field take-off speed	? KIAS
Normal cruise speed	? KIAS
Normal climb speed	? KIAS
VY (Best rate of climb speed)	? KIAS
VX (Best angle of climb)	? KIAS
Short field approach speed	? KIAS

Max. Taxiing Speed over rough ground	? Kts
Max. Ground Speed on take-off	? Kts
Max. Ground Speed on landing	? Kts

2.04 - ROTOR

Maximum rotor RPM	? rpm
Minimum rotor RPM in flight	? rpm
Minimum sustained load factor	? G
Minimum rotor RPM taxying	? rpm
Pre-rotator operation is limited to	?
Rotor brake must only be applied when less than	? rpm

2.05 - ENGINE

Maximum Engine RPM	? rpm
Normal Engine Idle RPM	? rpm
Minimum Oil Pressure	? PSI
Maximum Oil Pressure	? PSI
Minimum Water Temperature for Take-off	? deg C
Maximum Water Temperature	? deg C
Maximum Voltmeter Reading	? volts

2.06 - WIND

Maximum Wind Normal Operations	? Kts
Maximum crosswind	? Kts
Maximum Tailwind	? Kts

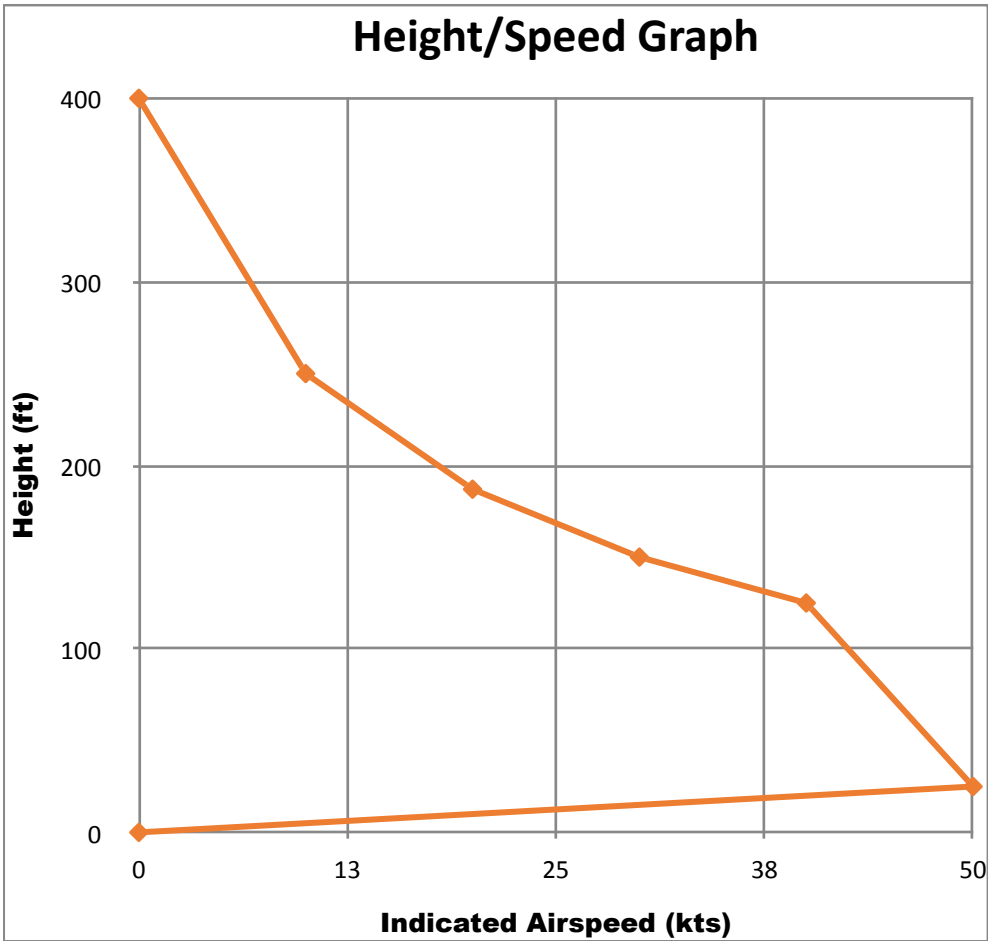
2.07 - MANOEUVRES

Aerobatic manoeuvres are prohibited.
Steep turns in excess of 60 degrees of bank are prohibited
Flight Load Factor Limits:
Positive G's…… "?"
Negative G's…….. Absolutely None
Avoid abrupt manoeuvres in the pitching plane.

2.08 - TYPES OF OPERATION

This aircraft is limited to flight by day in VMC.
Solo operations must be conducted from the "?" seat only.
For operations into registered/certified aerodromes, flashing beacons must be operating.

2.09 – HEIGHT SPEED GRAPH (MTOW)



Flight in this area is to be avoided

Safe Operation Area

Double click on the chart above and it will open as an imbedded object in Excel.
Select sheet 1 tab at the bottom of the window.
Fill in the values for the heights against the respective speeds.
When completed, click on Chart 1 tab at the bottom of the window then select an area outside the chart.
The height speed graph will update.
Delete this text when finished.

SECTION 3

NORMAL PROCEDURES

Never start the engine while standing outside the cockpit.

3.01 - PRE – FLIGHT INSPECTION

COCKPIT.

Master Switch – ON
Battery Volts – Checked
Fuel Quantity Indication – Checked
Rotor Tach and Engine Tach – Zero
Radio (if required) - Checked
Strobe and Landing Lights – ON. Check operation
Strobe and Landing Lights – OFF
Control Lock – OFF. Check full, free movement and correct sense
Rudder Pedals – Check full, free movement and correct sense
Control Lock – ON
Rotor Brake – Check operation
Trims – Checked
Seat Belts – Condition checked
EPIRB – Fitted & battery checked.

EXTERIOR.

Note: Commence this inspection from the left-hand side, adjacent to the pilot's seat.

Main wheels/disc brakes – Inflated, spins freely.
Fuel cap secure
Pitot Tube – Secure and clear
Radio Antennae – Secure
Nosewheel – Correct inflation, spins freely, spat secure
Windscreen – Clean
Landing light secure
Door hinges and latches – Checked
Upper Strobe Light – Secure
Rotor Head – No cracks or damage, Bolts secure, Lock Pins in place
Pre-Rotator Ring Gear – Checked
Pre-Rotator motor secure
Rotor Tach Sender Unit – Secure, Electrical connections intact.
Right-hand Control Rod – Checked. Rod ends free, Lock Nuts secure, Lock Pins in place
Trim Spring – Checked, Safety Cord intact
Coolant – Fluid visible in overflow tube.
Engine – No Oil or Coolant leaks. Electrical cables secure
Engine Mounts - Checked
Tall Tail top mount secure
Radiator and Hoses – Clean, no leaks

Fuel Pump and Lines – Electrical Cables secure, Fuel Lines intact, Fuel Filter clear
Fuel drain check carried out

Vertical and Lateral Struts – Secure
Main Wheel – Inflation, Spat secure
Propeller – Checked
Reduction Drive – no play or oil leaks
Rudder Cables – Checked
Right-hand Turnbuckle and Lock Wire – Checked
Right-hand Stabiliser – Secure
Rudder/Fin – Secure, Rudder moves freely
Rotor Blades (Both) – Clean, free from Damage, aligned Fore and Aft
Left-hand Turnbuckle and Lock Wire – Checked
Left-hand Stabiliser – Secure
Left-hand Control Rod – Checked. Rod ends free, Lock Nuts secure, Lock Pins in place
Alternator – Secure, Belt Tension
Battery – Secure, Lock Wire intact, Electrical Cables secure
Engine Oil Quantity – Checked, Dipstick secure
Engine Oil Filler – Cap secure

3.02 – BEFORE START

Passenger Briefing	Complete
Harnesses	Secure
Fuel	Sufficient for flight
Flight Instruments	Checked and Set
Switches	OFF
Circuit Breakers	Checked
Controls	Free, Correct Sense

3.03 – ENGINE START

Master Power Key (Left lower side of engine.)	ON
Ignition switch	ON
Brakes	SET
Control lock	Removed & secure
Choke	N/A
Battery Volts	Checked
Throttle	Set for Start
Engine/Propeller	CLEAR
Engine Start	Accomplish

3.04 – AFTER START

Throttle	Minimum Idle
Oil Pressure	Checked
Battery Volts	Checked
Radio Master Switch	ON

3.05 - TAXIING

Brakes	Checked
Nosewheel Steering	Checked
Pre-Rotator	Maintain 100 Rotor RPM Minimum

3.06 – BEFORE TAKE-OFF

QNH	Set
Trims	Set
Fuel	Quantity Checked
Instruments	Checked
Switches	Set
Harnesses	Secure
Landing Lights	ON

3.07 – AFTER TAKE-OFF

Engine Instruments	Normal

3.08 – BEFORE LANDING

QNH	Set
Fuel Quantity	Checked
Engine Instruments	Normal

3.09 – AFTER LANDING

Landing Lights	OFF
Control Lock	ON
Rotor Brake	Engage (Align Blades Fore and Aft)
Engine Instruments	Checked

3.10 - SHUTDOWN

Rotor Blades	Aligned Fore and Aft
Rotor Brake	As required
Radio Master Switch	OFF
Engine Ignition Switch	OFF
Strobe Light Switch	OFF
Master Switch	OFF
Rotor Blades	Secured

SECTION 4

EMERGENCY PROCEDURES

4.01 – ENGINE FIRE DURING START

Master Switch	OFF
Engine Ignition Switch	Crank Engine

If the Fire extinguishes:

Engine Ignition Switch	OFF

If Fire persists:

Engine Ignition Switch	OFF
Evacuation	Order
Fight Fire with Ground Equipment	Located under R/H seat

4.02 – ENGINE FAILURE

Control	Maintain
Airspeed	Establish Glide at ? KIAS
Landing Area	Identify and Track towards
Trouble-shooting	Accomplish

If Engine Fails to Start:

Radio	Broadcast MAYDAY
Master Switch	OFF
Engine Ignition Switch	OFF
Emergency Landing	Accomplish

4.03 – ENGINE FIRE IN FLIGHT

Master Switch	OFF
Ignition switch	OFF

Emergency Landing	Accomplish

4.04 – ELECTRICAL FIRE INFLIGHT

Individual Electrical Circuits	Isolate

If Fires persists:

Master Switch	OFF
Engine Ignition Switch	OFF
Emergency Landing	Accomplish

4.05 – ELECTRICAL MALFUNCTIONS

Excessive Battery Volts:

Non-essential Electrical Circuits	Isolate

Land as soon as possible

Low Battery Volts:

Non-essential Electrical Circuits	Isolate

Land as soon as possible

4.06 – DITCHING

MAYDAY	Transmit
Lifejackets	Fit (do not Inflate inside the cabin)
EPIRB	Activate
Cabin Doors	N/A

Flare to a full stop at 10 feet AGL. Level airframe with control stick.
On touchdown, roll to the right.

4.07 – LANDING WITH THE ENGINE AT IDLE OR STOPPED

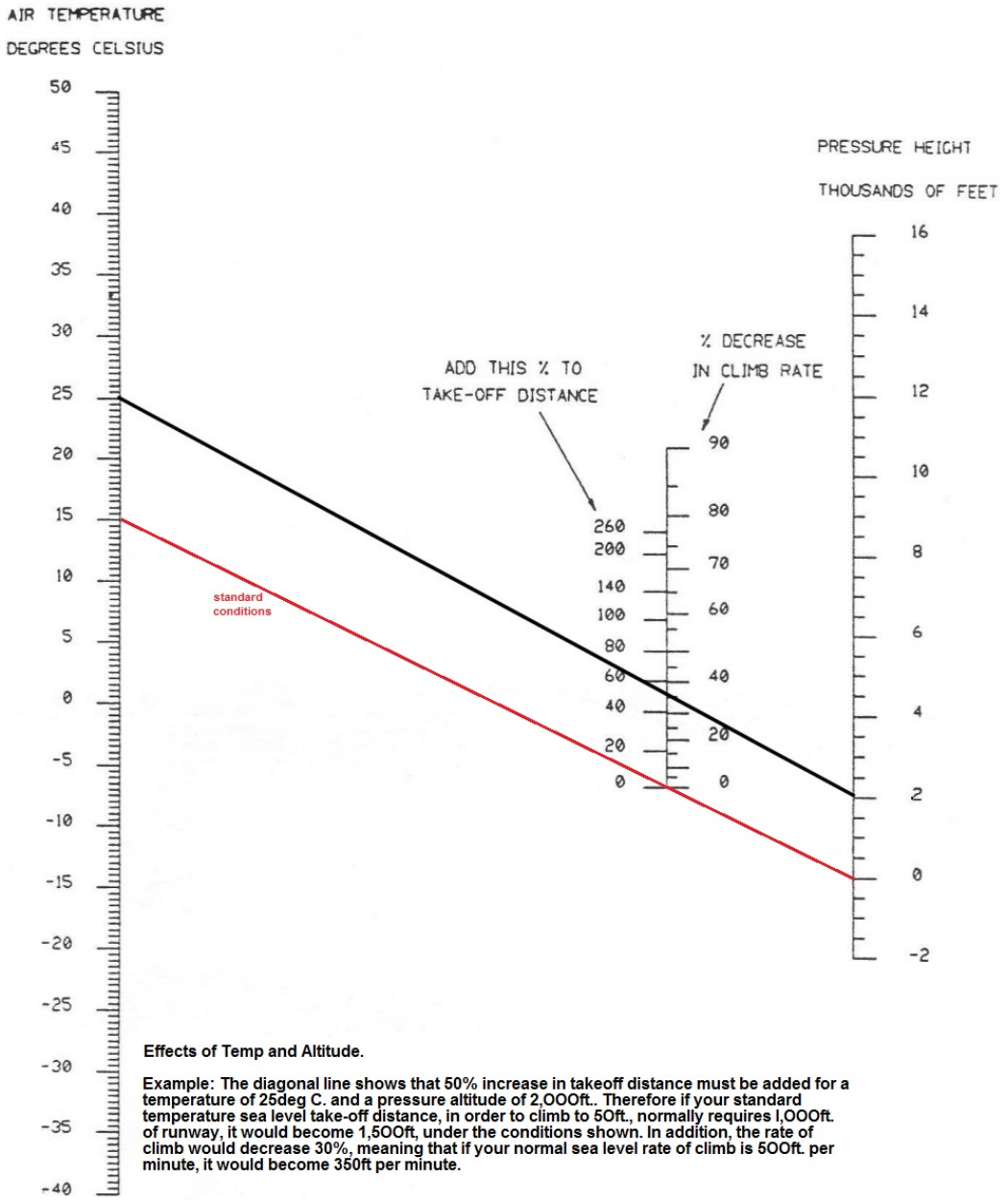
When landing with an engine at Idle, the pilot MUST be aware of the reduction of rudder effectiveness caused by the loss of propeller slipstream over the rudder.

Side slips must be avoided and every effort must be made to prevent any yaw tendency, particularly as a landing flare is commenced.

The best way of retaining whatever power-off rudder authority is left is to maintain adequate airspeed into the landing flare.

SECTION 5

PERFORMANCE CHART



Effects of Temp and Altitude.

Example: The diagonal line shows that 50% increase in takeoff distance must be added for a temperature of 25deg C. and a pressure altitude of 2,000ft.. Therefore if your standard temperature sea level take-off distance, in order to climb to 50ft., normally requires l,000ft. of runway, it would become 1,500ft, under the conditions shown. In addition, the rate of climb would decrease 30%, meaning that if your normal sea level rate of climb is 500ft. per minute, it would become 350ft per minute.

END OF DOCUMENT